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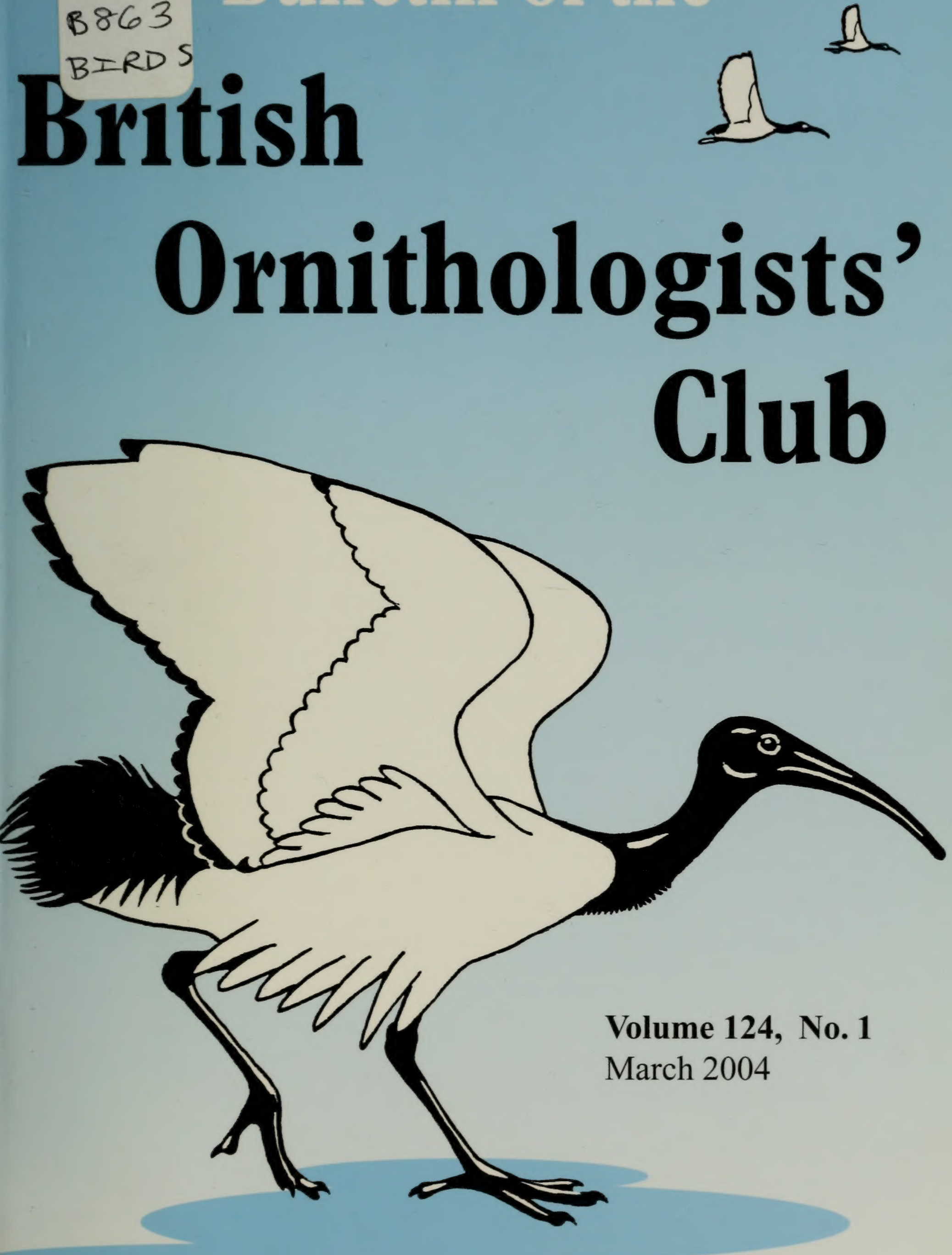
Bulletin of the British Ornithologists' Club



Volume 124, No. 1
March 2004

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London, SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. [Limited car parking facilities can be reserved (at a special reduced charge of **£5.00**), on prior application to the Hon. Secretary].

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm.** (A vegetarian menu can be arranged if ordered at the time of booking). Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges were increased to **£19.00**, as from **1st January 2004.**

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

Tuesday 27 April—ANNUAL GENERAL MEETING at 6 pm, followed by a **Club Social Evening**. There will be no speaker, but Members are invited to bring along one or two slides (or a specimen) of a bird of topical interest, and to speak **for not more than 5–10 minutes** about it. The aim will be to generate discussion, and to facilitate the exchange of information between Members.

Applications to Michael Casement *including subjects to be raised, and any special facilities required, by* ***13 April,*** *please.*

Tuesday 22nd June—Dr P.J.K McGowan '*Threatened pheasants and partridges in Asia*'
Philip McGowan first encountered pheasants in Asia during two months fieldwork to plan the boundaries of the Great Himalayan National Park in Himachal Pradesh, NW India, in February/March 1983. Since then he has carried out surveys and intensive fieldwork on pheasants and partridges elsewhere in northern India, on Palawan in the Philippines, southwest China and in Malaysia. He compiled IUCN Action Plans for three groups of Galliformes and is now the Conservation Director of the World Pheasant Association. His role is to promote action on behalf of the world's Galliformes, which is amongst the most threatened of avian orders. On the current IUCN Red List 11% of bird species are considered at risk of extinction, whereas for the Galliformes it is 25%. The pressures seem most serious in Asia, where 50% of the world's pheasant species are listed as threatened.

Applications to Tony Statham **(Note this change)** *by* ***8 June,*** *please.*

Tuesday 28th September—Professor Glen Chilton - '*The curse of the Labrador Duck*'
Glen Chilton is an Associate Professor of Biology at St. Mary's College in Calgary, Canada. For the past 18 years, most of his research efforts have concerned the songs of birds, particularly the evolution of songs in crowned sparrows and New World warblers. This work has taken him to some of the most remote parts of North America. He is currently on a research sabbatical in the UK. Nine years ago, while constructing the species account of the extinct Labrador Duck for the *Birds of North America* series, he became fascinated by the stories associated with this species. They are stories of murder, theft, enormous wealth, and wartime crimes. Glen is now travelling the world to examine all remaining stuffed specimens, and is writing a book about his adventures.

Applications to Tony Statham *by* ***14 September*** *please.*

Future meetings in 2004. The following **Tuesdays** have been booked:
2 November—Speaker to be arranged
7 December—Speaker to be arranged

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2005, giving as much advance notice as possible—please contact: Tony Statham, Woodcock Hill, Durrants Lane, Berkhamsted, Herts. HP4 3TR UK, (or e-mail: SAHS@tinyonline.co.uk)

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Bulletin of the
BRITISH ORNITHOLOGISTS' CLUB

Vol. 124 No. 1 Published 5 March 2004

CLUB ANNOUNCEMENTS

Membership News

Hon. Life Member—Rule (3). Congratulations to Bryan Sage after 50 years continuous membership (1954–2004).

We regret to report the death (in July 2001) of Dr R.S. Marrus (1994–2001).

Hon. Secretary. As announced in BBOC 123 (4), Michael Casement is standing down as *Hon. Secretary* and, subject to agreement at the AGM (see below), Tony Statham will assume this responsibility as from 1 May 2004; Michael Casement will continue as *Hon. Membership Secretary* until further notice.

Free Membership for Students for 2004. Free membership has been offered, on a trial basis for one year, to suitably qualified students. We are delighted to welcome 41 successful applicants, from a wide spread of countries, with addresses in: UK (5), USA (6), Africa (7), Asia (10—including five from Indonesia), and South and Central America (13). We wish them well in their studies in the coming year.

The BOC Website - http://www.boc-online.org The number of enquiries continues dramatically to increase and the major re-design, in 2003, incorporates a number of new features to make it more user-friendly. Do please look at it and let Paul Salaman have your comments.

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club will be held in the Sherfield Building, Imperial College, London SW7 at 6.00pm on Tuesday 27 April 2004.

AGENDA

1. Minutes of the 2003 Annual General Meeting (see *Bull. Brit. Orn. Cl.* 122 (3): 66–71).
2. Chairman's report.
3. Trustees Annual Report and Accounts for 2003 (both to be distributed at the meeting).
4. The *Bulletin*. Editor's report.
5. Publications report—by Revd. T.W. Gladwin, Chairman JPC
6. The election of Officers. The Committee proposes that:
   (i) Mr S.A.H. Statham be elected as *Hon. Secretary* (vice Commander M.B. Casement).
   (ii) Mr D.J. Montier be re-elected as *Honorary Treasurer,*
   (iii) Professor R.A. Cheke be elected as *Hon. Publications Officer* vice J.A. Jobling.
   (iv) Mr J.P. Hume to be elected vice Mr S.A.H. Statham
   (v) Commander M.B. Casement, OBE, RN, to continue (*ex-officio*) as *Hon. Membership Secretary.*
7. Any other business of which notice shall have been given in accordance with Rule (12).

The 920th meeting of the Club was held Tuesday 2nd December 2003, in the Sherfield Building Annexe, Imperial College. 23 Members and 9 guests were present. Members attending were: Mrs M.N. MULLER (*Chairman*), Miss H. BAKER, I.R. BISHOP, Mrs D.M. BRADLEY, Dr.A.P. BUCKLE, Cdr. M.B. CASEMENT RN, Professor R.A. CHEKE, J.B. FISHER, F.M. GAUNTLETT, D. GRIFFIN, J.A. JOBLING (*Speaker*), R.R. LANGLEY, D.J. MONTIER, Mrs A.M. MOORE (*Speaker*), Dr. R.P. PRŶS-

JONES, R.E. SCOTT, P.J. SELLAR, T.R. SMEETON, S.A.H. STATHAM, N.H.F. STONE, C.W.R. STOREY, M.P. WALTERS, and Mrs F.E. WARR.

Guests attending were: M. BRADLEY, Ms G. BONHAM, Mrs M.H. GAUNTLETT, Mrs M. MONTIER, P.J. MOORE, C.A. MULLER, Mrs S.L. STONE, A.J. WARR, and R.W. WEBSTER.

After dinner, Amberley Moore and James Jobling gave a joint presentation entitled '*The unknown traveller—the ornithological collections of Louis Fraser*'. The following is a brief synopsis: Amberley Moore gave a presentation on the life of the Victorian collector Louis Fraser and James Jobling illustrated some of the specimens from Fraser's collection, now held in the Natural History Museum at Tring.

During his lifetime Louis Fraser (1819–*c*.1883) was widely acknowledged as an excellent and tireless naturalist and collector. Indeed, because of his attention to detail and breadth of his field notes he has been considered the first of the modern collectors. Of modest education he began work as an office boy at the Zoological Society of London in 1832. By 1841 he had become curator's clerk and had already contributed five papers to the *Proceedings of the Zoological Society of London* when, with the influence of the President of the Society Lord Derby, he was appointed naturalist to the ill-fated Niger Expedition, during which he made an important collection of birds and mammals in the Gulf of Guinea. Upon his return in 1842 he was re-employed by the Zoological Society, becoming curator in 1844. He began publication of his *Zoologica typica* in 1845, illustrating new species of birds and mammals first shown at meetings of the Zoological Society. The financial burden of the series proved to be too great and part XIV, published in March 1849, brought the series to a premature close. Fraser resigned his post in 1846 to take up a six-month contract to collect for Lord Derby in North Africa and on his own account in 1847. He became Temporary Curator of Lord Derby's collection at Knowsley in April 1848, where he compiled catalogues including a six-volume catalogue of birds (now held in manuscript at Liverpool Museum) and a catalogue of mammals, *Catalogue of the Knowsley collection*, which he published himself in 1850. He left Knowsley to take up the post of Vice-consul to the Kingdom of Dahomey from 1851 to 1853 during the reign of the notorious King Gezo. In 1857 Philip Lutley Sclater financed Fraser privately to collect for him in South America for three years.

During his several journeys abroad Fraser collected over 1,000 specimens from Tunisia, Dahomey [Benin] and the Niger, Fernando Póo [Bioko], Ecuador, Panamá, Guatemala and the United States. Over 645 bird specimens collected by Fraser have been identified presently in museum collections in Britain, Germany and the US. They include the type material of over 100 species. Fraser's name is commemorated in the distinctive Afrotropical flycatcher genus *Fraseria* Bonaparte, 1854, and his large collections in the Afrotropics and Neotropics gave birth to a raft of eponyms: *Deleornis fraseri* (Jardine & Selby, 1843); *Basileuterus fraseri* (Philip Sclater, 1884); *Conirostrum* (*cinereum*) *fraseri* (Philip Sclater 1859); *Threnetes* (*ruckeri*) *fraseri* (Gould, 1861); *Oreomanes fraseri* Philip Sclater, 1860; *Stizorhina fraseri* (Strickland, 1844); *Tympanistria* (*tympanistria*) *fraseri* Bonaparte, 1855; and *Tityra* (*inquisitor*) *fraseri* (Kaup, 1852). Opportunity was taken to show slides of many of Fraser's specimens in the type collection at Tring; such as *Cisticola lateralis* (Fraser, 1843), *Nigrita fusconota* Fraser, 1843 and *Linurgus olivaceus* (Fraser, 1842). Other slides of birds from his collections now held at Tring, Liverpool and Cambridge illustrated his distinctive small circular collectors' labels often cut from menu cards and sailing dockets!

Although Fraser's earlier career can be verified by official papers and his private correspondence, his latter years are ill-documented. Philip Sclater's correspondence and papers were kept by his son, William, and it is probable that Fraser's Ecuadorian correspondence, which must have been extensive, and his field notes, were lost when the Sclater home in London was destroyed by a flying bomb during the Second World War.

Fraser's last written records are found on the labels of three birds taken in Florida in 1883 and now in the UMZ at Cambridge; Carolina Parakeet *Conuropsis carolinensis* labelled 'Wekiva River Fl[orid]a Mar. 8 1883', Roseate Spoonbill *Ajaia ajaja* labelled 'Kissimmee River Fl[orid]a May 9. 1883', and Anhinga *Anhinga anhinga* labelled 'Sanford Fl[orid]a July 3 1883'.

It is probable that Louis Fraser died in North America before 1888, but no record of his death has been found.

The 921st meeting of the Club was held Tuesday 20th January 2004, in the Sherfield Building Annexe, Imperial College. 30 Members and 11 guests were present.

Members attending were: Dr C.F. MANN (*Chairman*), D.N.S. ALLEN, Miss H. BAKER, I.R. BISHOP, Mrs D.M. BRADLEY, Dr. A.P. BUCKLE (*Speaker*), Cdr. M.B. CASEMENT RN, D.R. CALDER, Captain P. CARR RM, S.E. CHAPMAN, Professor R.A. CHEKE, Dr. R.A.F. COX, R.C. DICKEY, F.M. GAUNTLETT, A. GIBBS, D. GRIFFIN, Dr. J. GROOMBRIDGE, C.A.R. HELM, J.P. HUME, J.A. JOBLING, R.H. KETTLE, .R. LANGLEY, D.J. MONTIER, Mrs M.N. MULLER, Dr. R.P. PRŶS-JONES, N.J. REDMAN, P.J. SELLAR, S.A.H. STATHAM, C.W.R. STOREY, and R.W.WEBSTER.

Guests attending were: Ms G. BONHAM, A.J. BRAY, Mrs C.R. CASEMENT, B.J. HUGHES, Mrs M.H. GAUNTLETT, Mrs M. MONTIER, R. RANFT, Mrs W. SPENNING, Dr. F.J. ZINO, (*Speaker*) Mrs E. ZINO and Miss F. ZINO.

After dinner, Frank Zino followed by Alan Buckle gave two splendidly illustrated presentations, under the overall title: *Rats on Oceanic Islands—Impacts and Management.* The following is a brief synopsis of the two talks:

Frank Zino: The rediscovery of *Pterodroma madeira*

When first handled by Padre Ernesto Schmitz in 1903 this bird was identified as *Oestrelata feae* and, by 1934 when defined by Mathews as a subspecies of *Oestrelata mollis*, it was thought to be extinct. Schmitz sold many specimens to European museums, including nine of what we now know as Zino's Petrel *Pterodroma madeira*. Two more birds were found in 1909 but for decades after that many considered the bird extinct. In October 1940 and October 1951, however, recently fledged birds were attracted to the lights of Funchal and this led Gunther (Jerry) Maul and Alec Zino (PAZ) to think that a colony of *P. madeira* still existed on Madeira.

In 1963 Maul organised an expedition to the Selvagem Islands through the Museu Municipal do Funchal (MMF). Christian Jouanin and Francis Roux were on this expedition and awakened the Zino family's interest in birds. They returned to Madeira over subsequent years and, with PAZ on his yacht *Yam Seng*, visited many of the islands around Madeira, including Bugio. There, Fea's Petrel *Pterodroma feae* was studied and PAZ made excellent recordings of its calls. PAZ reasoned that if *P. madeira* and *P. feae* were so alike their calls might be similar. He played his recording to shepherds from the area where Schmitz had collected his birds and one identified the calls as "the souls of Cidrão". In April 1969 the approximate breeding area was identified and nests were found the next month. PAZ then left for the Selvagems and should have been accompanied by a French ornithologist, a priest, who missed the boat. On 15 June 1969, the priest went to PAZ's office and met the men PAZ had organised to search for the breeding birds, who reported finding birds and eggs in burrows. The priest opportunistically organised an expedition the next day using the same men, who had been told not to touch any bird or egg.

PAZ returned from the Selvagems late on 15 June and the next day received a call from Pico do Areeiro, saying that they had the birds! He rushed to Areeiro, where he was met by his men with eight birds and six eggs of a species, up to then, considered extinct! After much negotiating, six birds were released. The priest took the eggs, giving one to the MMF (since stolen) and one to PAZ. The next day the Frenchman took another egg and bird. After this disaster, work continued quietly for fear of more collectors. In 1985–86 it was noted that there was no successful breeding on the ledges due to rat predation. We needed outside help and after a fortuitous meeting with Andy Swash of MAFF on Selvagem Grande, he introduced us to Dr Alan Buckle, then at ICI, who came to the rescue, and continues to support us.

Alan Buckle: Rodents on oceanic islands—impacts and management

Since the earliest days of exploration humans have accidentally, and sometimes purposefully, introduced rodents (mainly Norway Rats *Rattus norvegicus*, but also Ship or Black Rats *Rattus rattus* and Polynesian Rats *Rattus exulans*) to places where they have landed and colonised. On the islands the rodents preyed upon species poorly adapted to withstand their depredations. The full extent of this disaster on the biodiversity of the world's oceanic islands will never be known but in two recent cases, Lord Howe Island and Big South Cape Island, ornithologists were able to record the rodents' catastrophic impact on the islands' avifauna. Many species were extinguished and populations of others decreased dramatically. Thanks to the development of a range of management techniques, pioneered mainly by workers from New Zealand, conservationists now have an ability either to remove alien rodents from islands or, if this is impractical, to control rodents in particularly sensitive areas to allow endangered species a chance to recover.

Zino's Petrel breeds in burrows on cliff ledges among the peaks of Madeira's central mountain range. During the mid-1980s the birds failed to breed successfully for several years as rats, coming up from the forests below, had infested the breeding ledges. The site was surveyed and, after detailed planning which included an environmental impact assessment, a rodent control programme was initiated to protect the birds. This involved the placement of specially designed rodenticide bait boxes, both in a 'cordon sanitaire' around the breeding ledges and on the ledges themselves. The difficult work of maintaining this programme has continued every year since, thanks to the efforts of the Freira Conservation Project and the Natural Park of Madeira (see Zino *et al.*, 2001, *Oryx* 35: 128–136 and www.pnm.pt). Breeding was at first slow to re-establish but has improved in recent years, with a record in 2003 when > 20 chicks fledged. Different problems faced the workers of the Natural Park of Madeira on Great Salvage Island, 160 nautical miles south of the Madeira mainland. The island was overrun with Rabbits *Oryctolagus cuniculi* and House Mice *Mus* sp. A project was initiated in 2002, aimed at the complete eradication of these species from the 240-ha island, in order to protect breeding seabirds and to support application for UNESCO World Heritage Site status. The island is a breeding station for globally important colonies of the White-faced Storm-petrel *Pelagodroma marina*, Madeiran Storm-petrel *Oceanodroma castro*, Bulwer's Petrel *Bulweria bulwerii*, Little Shearwater *Puffinus assimilis* and Cory's Shearwater *Calonectris diomedia*. Once again, severe difficulties of planning and logistics were overcome to establish and maintain a grid of rodenticide baiting stations over the entire island for more than one year. The rabbits were quickly removed and careful surveys in November 2003 failed to discover any signs of mice. The final outcome of the project, which also involved scientists from the UK Forestry Commission and the University of Reading, is eagerly awaited.

The talk concluded with a vigorous and enthusiastic discussion.

Notes on the type of *Bubo virginianus sclariventris*

by Robert W. Dickerman

Received 8 October 2001; revision received 29 January 2004

In attempting to make order out of the variation he noted among the 50 pale Great Horned Owls *Bubo virginianus* from Ontario in the Royal Ontario Museum (ROM), Snyder (1961) divided them into more heavily and less heavily barred groups. Considering the less heavily marked birds to be *subarcticus*, he named the darker birds *B. v. sclariventris,* using a female taken on 26 February 1948 as the holotype. The condition of its gonads was not given. He apparently used only specimens in the ROM, and did not mention the existing types of *subarcticus* and *occidentalis*. The range of *sclariventris* was mapped by Karalus & Eckert (1974), Johnsgard (1988) and McGillivray (1989), and the name was used by James (1991) and Pittaway (1993).

Godfrey (1986) and Browning (1990) were unable to express an opinion on the validity of *sclariventris*, and it has not been included in any taxonomic work to date, including Houston *et al.* (1998) and König *et al.* (1999). Dickerman (1992) studied the series of 60 nesting-season specimens of the subarctic populations in the then National Museum of Canada, Ottawa, and found no distinctive subpopulations, but the Ottawa collection is weak in material from Ontario.

To help evaluate the validity of the name *sclariventris*, James A. Dick and S. Ross James of the ROM selected for me paratype 34,2,2,1 as being most similar to the holotype. I compared it with the types of *subarcticus* and *occidentalis* in the Academy of Natural Sciences in Philadelphia. Those two types differ, that of *occidentalis* being more heavily barred. Giving some allowance for possible spoiling of the specimens due to their different ages (1948 *vs* 1880), the paratype of *sclariventris* was a very close match to the holotype of *occidentalis*. Thus *B. v. sclariventris* Snyder is a junior synonym of *B. v. occidentalis* Stone, earlier considered to be a junior synonym of *B. v. subarcticus* Hoy (Stone 1897, Dickerman 1991).

In the absence of adequate nesting-season material, especially from the northern fringes of the range, *subarcticus* must be used for specimens showing a spectrum of variation in the extent of dark markings, and perhaps in the degree of buffy coloration (Dickerman 1992). If in the future *subarcticus* is subdivided, close attention must be paid to the differences between the types of *subarcticus* and *occidentalis*, both migrants, from Wisconsin and Iowa respectively.

Acknowledgments

I wish to especially thank J. A. Dick and S. R. James of the ROM for selecting the relevant paratype and for the loan thereof. My gratitude goes to the curators of the several museums where specimens were examined: Academy of Natural Sciences, Philadelphia; American Museum of Natural History, New York; and the National Museum of Natural History, Washington, D.C.

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Interesting distributional records and notes on the biology of bird species from a cloud forest reserve in north-west Ecuador

by Juan F. Freile & Jaime A. Chaves

Received 1 January 2003

Even in well-studied countries, such as Ecuador, new distributional records and range extensions are regularly reported as unexplored or poorly known areas are surveyed (e.g. Krabbe 1992, Krabbe *et al.* 1997, Freile 2001a). In this note we present new records, as well as latitudinal and altitudinal range extensions for several species, taking Ridgely & Greenfield (2001) as our baseline. Our records are based on studies carried out at Bosque Integral Otonga (hereafter Otonga), from March 1999 to February 2002 (see also Chaves 2001). Elevation is given within each species account. Taxonomy follows Ridgely & Greenfield (2001).

Study area

Otonga is a private reserve located in north-west Cotopaxi province (00º25'S, 79º00'W), on the outer slopes of the western Andes, ranging from *c.* 1,300 to 2,200 m elevation. It is located *c.* 5 km west of San Francisco de Las Pampas, in the middle section of the Toachi river drainage, adjacent to the Río Lelia Protection Forest (*c.* 4,000 ha), and less than 20 km north of the large Los Illinizas Ecological Reserve (149,900 ha) (Fig. 1). It comprises *c.* 1,000 ha of primary montane cloud forest, secondary forest and some degraded areas (Jarrín 2001). Our surveys were restricted to altitudes above 1,700 m due to the inaccessibility of lower areas. The bird community at Otonga has not been previously studied, but it resembles that of other cloud forest sites further north (Chaves 2001), and especially the avifauna of a site located nearly 30 km to the south, also in Cotopaxi province (Caripero area; N. Krabbe, *in litt.* 2003).

Vegetation at Otonga is characterised by the diversity and abundance of epiphytic plants, especially bromeliads, aroids and mosses, and by several tree species typical of Andean cloud forests of north-western Ecuador (Jarrín 2001, Nowicki 2001).

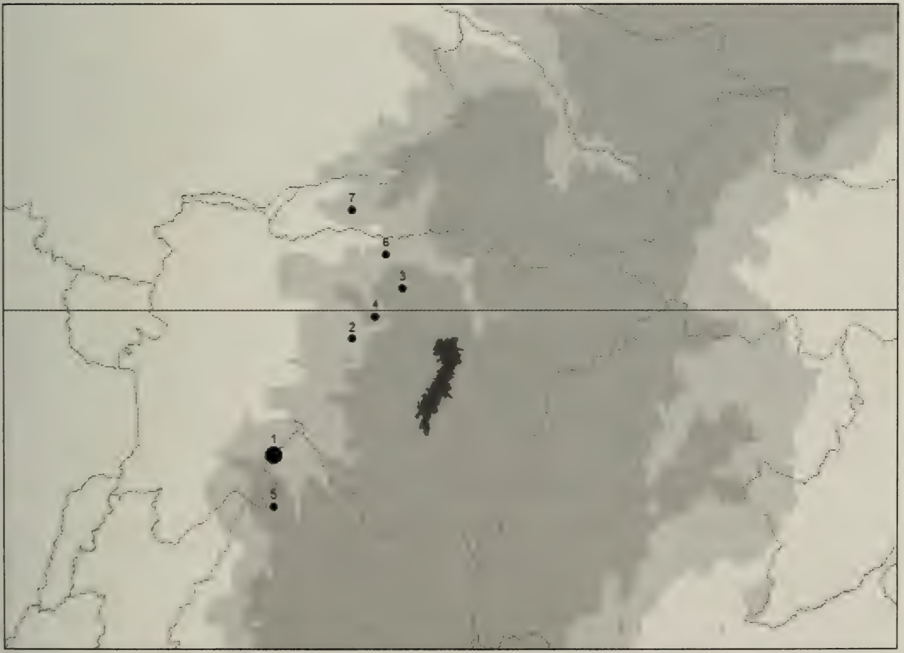

Figure 1. Map of Pichincha and Cotopaxi provinces, and adjacent areas, north-western Ecuador, showing the Bosque Integral Otonga (large circle, number 1) and other localities mentioned more than once in the text. Scale 1: 2,000.000. 1 Bosque Integral Otonga, 2 Mindo, 3 Reserva Maquipucuna, 4 Tandayapa, 5 Caripero, 6 Palmitopamba, 7 Los Cedros Reserve. Light grey: areas above 1,000 m elevation; dark grey: areas above 2,000 m; blackish grey: Quito city.

Species accounts

SEMICOLLARED HAWK *Accipiter collaris*

This rare and Near Threatened, though probably under-recorded hawk is known from very few sites along the Andes of Ecuador, with recent records from the western slope concentrated in the Mindo-Tandayapa area (BirdLife International 2000, Ridgely & Greenfield 2001). At Otonga an *Accipiter* thought to be this species was recorded on two separate occasions, at 1,900 m elevation. One was seen soaring above a cleared area adjacent to primary forest in July 2000, and one was seen briefly, attacking a flock of Dusky Bush-tanagers *Chlorospingus semifuscus*, in a secondary forest edge in February 2002. It was distinguished from other *Accipiter* species that might occur at Otonga (Plain-breasted *A. ventralis* and Bicoloured Hawks *A. bicolor*) by its heavily banded underparts (excluding whitish chin and throat) and relatively small size (see Ridgely & Greenfield 2001). It was also distinguished from *Micrastur* forest-falcons by its smaller size, whitish throat and chin, tail bars of similar length, and because forest-falcons never soar (R. S. Ridgely, pers. comm., 2003). Otonga is located *c.*60 km to the south of Mindo-Tandayapa area. Further sightings are necessary to confirm its status in the Otonga area.

BLACK-AND-CHESTNUT EAGLE *Oroaetus isidori*

At Otonga one was seen attacking a flock of three Sickle-winged Guans *Chamaepetes goudotii* on 15 December 1999, and in February 2003 one was briefly seen soaring above a largely forested area. This rare and Near Threatened eagle is known from only a handful of sites in the western Andes of Ecuador, primarily from western Pichincha province, but has also been recorded from the Caripero area, 30 km to the south of Otonga (Ridgely & Greenfield 2001).

WATTLED GUAN *Aburria aburri*

Several were heard and tape-recorded inside secondary and primary forest from 1,800 to 2,000 m elevation, and occasionally from forest borders along abandoned pasture areas. Vocalisations were not heard between February and March, the wettest months in the area, suggesting either that this species migrates seasonally (see Fjeldså & Krabbe 1990, Freile 2001b), or that vocal activity is restricted to other months of year. Ranked as Vulnerable in Ecuador and as Near Threatened globally (BirdLife International 2000, Pacheco 2002), there are very few records in the western Andes of Ecuador, wherein it is only known from the Mindo-Tandayapa-Maquipucuna area and from Las Pampas region (Marín *et al.* 1992, Ridgely & Greenfield 2001). Otonga constitutes its southernmost locality in the western Andes of Ecuador (Ridgely & Greenfield 2001). Hunting of this species in the Otonga area seems very infrequent, as it is fairly common even at forest borders. The presence of this species at Otonga is apparently an indicator of the good condition of forests in the area (N. Krabbe, pers. comm. 2003).

DARK-BACKED WOOD-QUAIL *Odontophorus melanonotus*
The distribution of this species extends south to western Cotopaxi wherein it is known from the Otonga and Caripero areas (Ridgely & Greenfield 2001). At Otonga at least seven family groups were regularly recorded along 10 km of transects (in an area of *c.* 100 ha) mainly in continuous primary or secondary forest floor, but also in small remnant patches of forest surrounded by pastureland and sugarcane crops. Most groups constituted one adult male, one adult female and at least two juveniles. On two occasions groups were observed ascending up to 12–13 m into forest sub-canopy before dusk.

MAROON-TAILED PARAKEET *Pyrrhura melanura*
Groups of 2–5 individuals were recorded at the reserve up to 2,200 m elevation. We recorded it in February 1998, March 1999 and August 1999, but not in September–November 2000 and February 2002, suggesting that it may make seasonal or erratic movements. Flocks were seen eating *Ficus* spp. (Moraceae) and *Alchornea* sp. (Rubiaceae) fruits and flying over both forested and open areas. Previously only reported up to 1,900 m in western Ecuador (Ridgely & Greenfield 2001), in the Caripero area (R. S. Ridgely, pers. comm., 2003).

LITTLE CUCKOO *Piaya minuta*
One was seen at close range perching in 4-m tall bushes and in a secondary forest border on 20 February 2002, at 1,900 m elevation. In western Ecuador this species has been reported up to 1,500 m (at Mindo and Maquipucuna, see Ridgely & Greenfield 2001; and at Palmitopamba and Los Cedros Reserve, pers. obs.). As the Little Cuckoo was not recorded during previous visits to Otonga, it may not be resident. It has been seen occasionally around Tandayapa Bird Lodge, Pichincha province, up to 1,750 m (R. S. Ridgely, pers. comm., 2003).

RUFESCENT SCREECH-OWL *Otus ingens colombianus*
Otonga constitutes the southernmost site for this taxon in the western Andes of Ecuador (Fitzpatrick & O'Neill 1986, Freile & Chaves 1999), but is within the range estimated by Krabbe *et al.* (1998). The taxon *colombianus* has previously been considered as a species (Krabbe *et al.* 1998, Freile & Chaves 1999), an opinion supported by its vocalisations (N. Krabbe, *in litt.* 2003).

OILBIRD *Steatornis caripensis*
The Oilbird is a scarce and local species, with records scattered throughout the Ecuadorian Andes (Ridgely & Greenfield 2001). At Otonga flocks of 4–20 were seen and tape-recorded in September–October 2000, foraging at primary forest tree fall gaps, at 2,000–2,100 m. Birds were seen taking fruits of *Nectandra* sp. (Lauraceae) and *Wettinia* sp. (Arecaceae). Its presence at Otonga is apparently seasonal, being apparently absent from December through August.

GREEN-FRONTED LANCEBILL *Doryfera ludovicae*
This hummingbird was previously known to occur up to 1,700 m on the western slope of the Andes (1,900 m on the eastern slope) (Ridgely & Greenfield 2001). At Otonga we mist-netted one female on a secondary forest ridge at 2,100 m elevation, on 26 February 2002. This was the only record of this inconspicuous species in the reserve, suggesting that it is either not numerous or it undertakes seasonal movements.

EMPRESS BRILLIANT *Heliodoxa imperatrix*
Ranked as Vulnerable within Ecuador (Ortiz-Crespo 2002), due to habitat loss within its limited distribution, and because of its relative natural rarity (Ridgely & Greenfield 2001), this striking hummingbird is known from very few sites in the western Andes of Ecuador, south to northern Pichincha province (Mindo area) (Ridgely & Greenfield 2001, Ortiz-Crespo 2002). At Otonga we mist-netted two females inside primary and secondary ridge-top forests at 2,100–2,200 m, and observed one adult male feeding on introduced *Abutilon* sp. (Malvaceae) and native plants (families Solanaceae and Rubiaceae) along a secondary forest border. Our record at Otonga constitutes a 60 km southward range extension.

GORGETED SUNANGEL *Heliangelus strophianus*
Near endemic to the north-western Andes of Ecuador. Its distribution extends continuously to northern Cotopaxi and apparently patchily south to El Oro province (Ridgely & Greenfield 2001); however, this might be due to poor knowledge and under-collecting in the central portion of the western Andes of Ecuador (N. Krabbe, pers. comm. 2003). At Otonga it was frequently recorded between 1,800 and 2,200 m elevation in primary and secondary forests, as well as forest borders and partially deforested areas. It was seen feeding on several plant species, especially on bromeliads (*Guzmania variegata*, *G. squarrosa* and *Tillandsia truncata*; see Castañeda 2001), and *Abutilon* sp. (introduced Malvaceae), an unidentified Solanaceae, *Posoqueria* sp. (Rubiaceae), another species of Rubiaceae and three species of Gesneriaceae. A nest, found in July 2000, was a shallow cup constructed mainly of moss and fine plant fibres, attached with spider web fibres, and was well hidden under a wet rocky wall 2.3 m above ground. It contained two eggs. This species has not been accorded any threat status to date. Nevertheless, we suspect it should be ranked as Near Threatened as it occurs in a very restricted distributional range (both altitudinal and latitudinal), and apparently prefers forested areas (at least is more numerous there), which are currently being destroyed at a fast rate (Sierra *et al.* 1999).

WHITE-FACED NUNBIRD *Hapaloptila castanea*
Previously recorded from very few sites in western Ecuador south to western Pichincha province (Tandayapa-Mindo area) and from a few sites along the eastern slope of the Andes (Ridgely & Greenfield 2001). At Otonga it was apparently rare

(<10 records during our three-year study), between 1,800 and 2,100 m altitude, and found only inside primary and tall secondary forest. Otonga represents the southernmost site for this species in western Ecuador, > 60 km south of Tandayapa-Mindo. According to the ranges estimated by Krabbe *et al.* (1998), northern Cotopaxi province (*c.*20 km south of Otonga) may be the southern limit of its distribution in western Ecuador, but there are no confirmed records there to date (R. S. Ridgely, pers. comm. 2003). Ridgely & Greenfield (2001) suggested that this species should be considered Data Deficient because it occurs at low densities along its whole range, even being absent from apparently suitable areas. We suggest that it should actually be ranked as Vulnerable within Ecuador (and Near Threatened globally?) due to its fairly limited distribution over an area with heavy human pressure (see Sierra *et al.* 1999), its preference for forested areas, and its probable natural rarity. It is currently known from a few privately protected forests in Ecuador (Cerro Golondrinas, Maquipucuna, Bellavista, Otonga, San Isidro), but its presence in the Sistema Nacional de Áreas Protegidas (National Protected Areas Network) is not yet confirmed.

TOUCAN BARBET *Semnornis ramphastinus*

This species is frequently found along forested areas in the western Andes of northern Ecuador and southern Colombia, south to northern Cotopaxi province (Ridgely & Greenfield 2001). At Otonga it was numerous inside primary and secondary forests, as well as along forest borders and open areas with tall standing trees, between 1,700 and 2,200 m. It was seen feeding on fruits of several tree species, but *Cecropia* spp. (Cecropiaceae; two species) and *Ficus* spp. (Moraceae; three species) were the most important food resources (for which this barbet is an important seed disperser; Chaves 2000). Although fairly numerous along its range, it is currently ranked as Near Threatened in Ecuador (Freile 2002) and globally (BirdLife International 2000).

RUSTY-WINGED BARBTAIL *Premnornis guttuligera*

In western Ecuador known from a handful of sites in western Pichincha province (Ridgely & Greenfield 2001), but its range has been estimated to extend south to northern Cotopaxi province (Krabbe *et al.* 1998), even though it has not been recorded in the Caripero area, 30 km south of Otonga, at appropiate elevations (R. S. Ridgely, pers. comm. 2003). At Otonga it was found inside primary and secondary forests between 1,900 and 2,200 m, mainly through mist-netting. It was occasionally seen accompanying mixed-species understorey flocks, but also in pairs or alone foraging at low heights in dense clumps of mosses and dead leaves. Otonga represents the southernmost site for this species in the western Andes, but gives further support to the range estimated by Krabbe *et al.* (1998). Two additional records from north-western Ecuador at Intag Cloud Forest Reserve, Imbabura province (1,850 m) and Chilma Alto, Carchi province (2,200–2,300 m) (J. Nilsson, pers. comm. to R. S. Ridgely) also fill in the apparent discontinuity in this species' distribution.

TAWNY-THROATED LEAFTOSSER *Sclerurus mexicanus*
This widespread species was previously known to occur in Ecuador locally up to 1,500 m (< 1,650 m in the eastern Andean slope) (Ridgely & Greenfield 2001). At Otonga a pair was seen inside primary forest at 2,000 m in September 2000. In February 2002 one was mist-netted, measured and photographed at 1,850 m. The only additional high-altitude record of which we are aware comes from the Tandayapa region, where it has also been recorded up to 2,000 m (M. Tellkamp, pers. comm. 2002).

SPILLMANN'S and NARIÑO TAPACULOS *Scytalopus spillmanni* and *S. vicinior*
These two species replace each other altitudinally along the Andes of north-western Ecuador and south-western Colombia, with Spillmann's inhabiting higher altitudes than Nariño (Ridgely & Tudor 1994, Ridgely & Greenfield 2001). At Otonga both species have been recorded from 1,900 up to 2,200 m inside primary and secondary forest, particularly in dense understorey, tree fall gaps and bamboo stands. Although they did not share territories or differ significantly in habitat choice, these two species showed a wider (300 m) altitudinal overlap at Otonga than recorded elsewhere (Krabbe & Schulenberg 1997, N. Krabbe, pers. comm. 2002). They responded to playback of each others' song, but Nariño Tapaculo was on average less aggressive. Natural features of the forest, such as ridgetops, tree fall gaps, trails, large dead logs or ravines were often the limits of territories. This intricate pattern of ecological overlap deserves further research to understand how these species segregate under syntopic situations (if they actually exclude each other). Similar patterns are also shown by several other tapaculo species (Krabbe & Schulenberg 1997), with altitudinal replacements and suture zones, rather than habitat segregation, being the most common situation (N. Krabbe, pers. comm. 2002).

BRONZE-OLIVE PYGMY-TYRANT *Pseudotriccus pelzelni*
Its distribution in western Ecuador is discontinuous, but the gap between southern Pichincha and northern Azuay provinces (Ridgely & Greenfield 2001) may be due to lack of collecting there. At Otonga this species was recorded frequently inside primary and secondary forests, particularly in dense understorey areas as re-growth tree fall gaps, between 1,800 and 2,000 m elevation. The Rufous-headed Pygmy-tyrant *P. ruficeps*, was also recorded at Otonga, but at slightly higher altitudes than the Bronze-olive. Although were not able to determine if both species were occurring in syntopy, overlap seems plausible as both were recorded at the same elevation (2,000 m), and in close proximity. This site is located *c.*30 km south of previously known records in northern Ecuador.

GREY-BREASTED MARTIN *Progne chalybea*
Several were observed flying above cleared areas on 22–23 February 2002, up to 1,750 m elevation. This numerous and widespread martin is more frequent at lower altitudes, but seems to undertake seasonal migratory movements (Ridgely &

Greenfield 2001). It was not recorded on our previous visits to Otonga or on subsequent days, suggesting that it is not a regular visitor or breeding species in the area. Unusually warm weather on the days of observations (pers. obs.) may account for its presence in the area.

BLACK-CHINNED MOUNTAIN-TANAGER *Anisognathus notabilis*
In Ecuador this species is mostly restricted to the north-west where it is known from few localities, but is also known from a few sites in the south-west (Ridgely & Greenfield 2001). At Otonga it was frequently found in primary and secondary forests, and in forest borders and open areas with tall standing trees, between 1,900 and 2,200 m. It was less numerous than the Blue-winged Mountain-tanager *Anisognathus somptuosus*, but it was regularly found accompanying mixed-species canopy flocks, and often only with *A. somptuosus*. The apparent absence of this species between Cotopaxi and El Oro provinces is possibly due to poor knowledge of this area (N. Krabbe, pers. comm. 2002).

YELLOW-BELLIED SISKIN *Carduelis xanthogastra*
There are few records of this species in western Ecuador (Ridgely & Greenfield 2001). Our only record at Otonga in three years was of two female-plumaged birds on 23 February 2002, perching and feeding in an isolated *Mimosa* tree in a degraded area next to a flowing stream, at 1,700 m. They were identified by the olive-coloured upperparts and foreparts, extending down to lower chest, and by the contrasting yellow wing patch 'uniformly' shaped (Ridgely & Greenfield 2001). Yellow-bellied Siskin may be either increasing in the north-western slopes of the Ecuadorian Andes, as suggested by Ridgely & Greenfield (2001), or it may make seasonal or nomadic movements along altitudinal or latitudinal gradients. A record from the Otonga area is mentioned in Ridgely & Greenfield (2001), but we are not aware of its source.

Other records

The Appendix below lists the birds we recorded at Otonga, including some endemics of the Chocó or West Slope of the Andes Endemic Bird Areas, as well as other threatened and Near Threatened species, both at national and global scales (BirdLife International 2000, Ridgely & Greenfield 2001, Granizo *et al.* 2002). Information on some of them (e.g. Cloud-forest Pygmy-owl *Glaucidium nubicola* and Moustached Antpitta *Grallaria alleni*) is published elsewhere (e.g. Freile & Renjifo 2003, Freile *et al.* 2003).

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Appendix

List of birds recorded at Otonga (1,700–2,200 m). Threatened, Near Threatened and restricted-range species are emboldened; species only observed en route to the reserve (below 1,800 m) are marked with an *. Species recorded only by Markus P. Tellkamp in April 2002 are marked with a [1], and species recorded only by Stewart White *et al.* in July–August 2002 are marked with a [2].

Coragyps atratus, *Cathartes aura*, *Pandion haliaetus*[2], *Chondrohierax uncinatus**, *Elanoides forficatus*, ***Accipiter collaris***, ***Leucopternis princeps***, *Buteo magnirostris*, ***Oroaetus isidori***, *Micrastur semitorquatus*, *Falco sparverius*, ***Aburria aburri***, *Chamaepetes goudotii*, ***Odontophorus melanonotus***, *Columba fasciata*, *Columba plumbea*, *Geotrygon frenata*, *Pyrrhura melanura*, *Bolborhynchus lineola*, *Pionus sordidus*, *Piaya cayana*, *Piaya minuta*, *Crotophaga ani**, *Tapera naevia**, ***Otus ingens***, ***Glaucidium nubicola***, *Steatornis caripensis*, *Nyctibius griseus*, *Lurocalis rufiventris*, *Caprimulgus longirostris*, *Uropsalis lyra*, *Streptoprocne zonaris*, *Cypseloides rutilus*, *Phaethornis syrmatophorus*, *Doryfera ludovicae*, *Amazilia tzacatl**, *Adelomyia melanogenys*, ***Heliodoxa imperatrix***, *Heliodoxa rubinoides*, ***Coeligena wilsoni***, *Coeligena torquata*, *Boissonneaua flavescens*, ***Heliangelus strophianus***, ***Haplophaedia lugens***[2], *Ocreatus underwoodii*, ***Aglaiocercus coelestis***, *Pharomachrus auriceps*, *Trogon personatus*, *Hapaloptila castanea*, ***Semnornis ramphastinus***, *Aulacorhynchus haematopygus*, ***Andigena laminirostris***, *Piculus rivolii*, *Piculus rubiginosus*, *Veniliornis fumigatus*, *Campephilus pollens*, ***Furnarius cinnamomeus****, *Synallaxis azarae*, *Synallaxis unirufa*, *Cranioleuca erythrops**, *Pseudocolaptes boissonneautii*, *Margarornis squamiger*, *Premnoplex brunnescens*, *Premnornis guttuligera*, *Syndactyla subalaris*, *Anabacerthia variegaticeps*, *Thripadectes virgaticeps*, ***Thripadectes ignobilis***[1], *Sclerurus mexicanus*, *Dendrocincla tyrannina*, *Xiphocolaptes promeropirhynchus*, ***Xiphorhynchus erythropygius***, *Lepidocolaptes lacrymiger*, *Campylorhamphus pusillus**, *Formicarius rufipectus*, ***Grallaria gigantea***, ***Grallaria alleni***, *Grallaria ruficapilla*, *Myornis senilis*, ***Scytalopus vicinior***, *Scytalopus spillmanni*, *Pogonotriccus ophthalmicus*, *Zimmerius chrysops*, *Mecocerculus poecilocercus*, *Serpophaga cinerea**, *Mionectes striaticollis*, *Mionectes olivaceus*[1], *Pseudotriccus pelzelni*, *Pseudotriccus ruficeps*, *Poecilotriccus ruficeps*, *Myiotriccus ornatus*, *Myiophobus flavicans*, *Pyrrhomyias cinnamomea*, *Contopus fumigatus*, *Sayornis nigricans*, *Ochthoeca diadema*, *Ochthoeca cinnamomeiventris*[1], *Myiarchus tuberculifer**, *Myiozetetes similis**, *Myiodynastes chrysocephalus*, *Tyrannus melancholicus*, *Pachyramphus versicolor*[1], *Pipreola riefferii*, *Lathria cryptolophus*[2], *Rupicola peruviana*, *Masius chrysopterus*, *Cyanolyca turcosa*, *Vireo leucophrys*, *Myadestes ralloides*, *Catharus fuscater*, *Turdus fuscater*, *Turdus serranus*, *Cinclus leucocephalus*, *Progne chalybea**, *Notiochelidon cyanoleuca*, *Stelgidopteryx ruficollis**, *Cinnycerthia olivascens*, *Troglodytes aedon**, *Troglodytes solstitialis*, *Henicorhina leucophrys*, *Parula pitiayumi**, *Dendroica fusca*, *Geothlypis semiflava**, *Myioborus miniatus*, *Basileuterus tristiatus*, *Basileuterus coronatus*, *Conirostrum albifrons*, *Diglossopis cyanea*, *Diglossa albilatera*, *Pipraeidea melanonota*, *Euphonia xanthogaster*, *Tangara arthus*, *Tangara parzudakii*, *Tangara ruficervix*, *Tangara nigroviridis*, *Tangara cyanicollis**, *Anisognathus somptuosus*, ***Anisognathus notabilis***, *Thraupis episcopus**, *Thraupis palmarum*, *Thraupis cyanocephala*, *Ramphocelus icteronotus**, *Piranga leucoptera**, *Chlorospingus canigularis*[2]*, ***Chlorospingus semifuscus***, ***Hemispingus melanotis***[2], *Catamblyrhynchus diadema*, *Pheucticus chrysogaster*, *Volatinia jacarina*[2], *Sporophila nigricollis*, *Atlapetes tricolor*, *Atlapetes leucopterus*, *Buarremon brunneinucha*, *Zonotrichia capensis*, *Carduelis xanthogastra**. Total= 155.

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A new subspecies of Sclater's Monal *Lophophorus sclateri* from western Arunachal Pradesh, India

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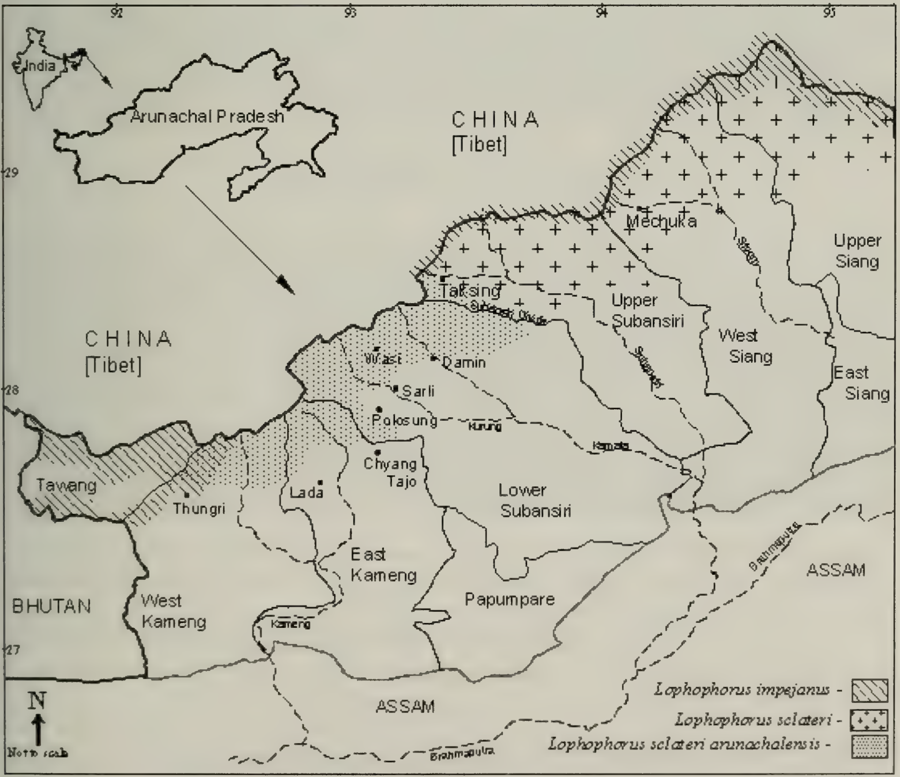
Sclater's Monal *Lophophorus sclateri* T. C. Jerdon, 1870, is one of three species of monal (Phasianidae). It is a restricted-range species occurring within the Eastern Himalayas Endemic Bird Area D08 (ICBP 1992), where it is found in the remote high mountains of Arunachal Pradesh in India, south-east Tibet, northern Myanmar and western Yunnan in China (Ali & Ripley 1983, Smythies 1986, Johnsgard 1986, McGowan & Garson 1995). Sclater's Monal has remained poorly known and is currently considered Vulnerable (Collar *et al.* 2001; also Fuller & Garson 2000). Most published information on this species is more than 50 years old and is largely based on natural history notes from Bailey (1916), Beebe (1918–1922), Baker (1919), Kinnear (1934), Ludlow & Kinnear (1937, 1944), Ali & Ripley (1948) and Ludlow (1951). A few recent surveys and studies have produced some information on this species (Kaul & Ahmed 1992, 1993, Kaul *et al.* 1995, Singh 1994, 1999, Han 2001, Rimlinger *et al.* 2001).

Within Arunachal Pradesh, *L. sclateri* was thought to occur from 92º–93ºE eastwards through the Kameng, Subansiri, Siang and Lohit Districts (Ali & Ripley 1983). However, the confirmed westernmost record for this species is from Mechuka locality in West Siang District, central Arunachal Pradesh (Kaul *et al.* 1995), east of

94°E. How far the species extended west and its exact western limit was not known. In the hope of collecting new locality records of this species, and also information on other Galliformes, a survey was conducted in early 1998 in western Arunachal Pradesh. The areas visited were along the Great Himalayan Range and especially in the East Kameng and Lower Subansiri Districts (Fig. 1), which had not been visited previously by biologists. During this survey evidence was obtained of a Sclater's Monal that differed morphologically from the published descriptions.

Discovery of the subspecies

In April 1998, while we were surveying the interior parts of Lower Subansiri, a few local tribesmen readily recognized *L. sclateri* (known locally as *thade*) from the pictures shown to them. They did, however, insist that the tail of the males was not coloured as in the picture (chestnut with a white subterminal band) but was completely white. Subsequently, SKR came across four completely white rectrices in the


92
93
94
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27
India
Arunachal Pradesh
CHINA [Tibet]
CHINA [Tibet]
Mechuka
Upper Siang
Taksing
Upper Subansiri
West Siang
East Siang
Wasi
Damin
Sarli
Poksung
Kurung
Kamala
Chyang Tajo
Lada
Tawang
Thungri
Lower Subansiri
East Kameng
Papumpare
ASSAM
BHUTAN
West Kameng
Kameng
ASSAM
Brahmaputra
Brahmaputra
N
Not to scale
Lophophorus impejanus - ▨
Lophophorus sclateri - ⊞
Lophophorus sclateri arunachalensis - ░

Figure 1. Map of Arunachal Pradesh showing the distribution of *L. s. arunachalensis* subsp. nov., along with that of the nominate form and Himalayan Monal.

possession of local people in Damin and Sarli localities in the district. Attached to the rectrices were a few iridescent bluish-green body feathers that were undoubtedly of a monal. The flat, almost square rectrices completely lacked the chestnut coloration of *L. sclateri* and resembled neither the Himalayan Monal *L. impejanus* nor the Chinese Monal *L. lhyusii*, in which the rectrices are cinnamon and iridescent bluish-green respectively. Local people hunt the monal for food and use the tail feathers as a status symbol, and bind the feathers of a complete tail together as a fan. Initially, we thought that the white rectrices might belong to subadults or a morph of *L. sclateri*, but no 'normal' *L. sclateri* tail feathers were found, and it was considered unlikely that the local people only hunted the monals with white tails. Furthermore, there was no mention of this species having any white tail feathers in the literature.

Davison (1974, 1978) proposed an eastern subspecies of Sclater's Monal *L. s. orientalis* based on differences in the width of the white subterminal band along the east–west axis of its range. He proposed that in the areas where *L. sclateri* overlaps with *L. impejanus*, the former has more white in the tail through character displacement. The white rectrices we collected were from an area where the above two species were thought to meet, but local people there did not recognize *L. impejanus* and believed that it did not occur in their area. No tail feathers of this species were seen, thereby rendering a character displacement explanation of our white-tailed birds somewhat doubtful.

Subsequent observations

10 May 1998. High mountain pass between Sarli and Chayang Tajo, East Kameng District. Tracks and feeding signs, claimed to be of monals by local people, found at 3,400 m but no birds seen.

17 October 1998. Pakdhung camp in the mountains north of Sarli. At 0545 h a male monal seen calling from above the camp in the alpine meadow zone at 4,200 m, with others heard nearby. Between 0600 h and 0930 h, four males and nine females seen and a pair photographed. In the following two days another five females were seen. Back in Sarli a badly damaged and maggot-infested skin of a male and female of the monal were seen with a hunter.

25 October 1999. Wasi camp close to Pakdhung at 3,800 m in the alpine scrub zone. A single male sighted by local assistants and in the following two days a male, female and two subadults were seen between 3,700 m and 3,900 m. At Sarli itself, SKR obtained three skins of the monal (a male, female and immature male) that were in the possession of local people. Another monal skin that appeared to be an immature was also observed with a hunter but could not be obtained.

8 November 1999. In the mountains higher up from Polosung village west of Sarli. One male monal sighted by local assistants at 3,700 m, and the following day a male

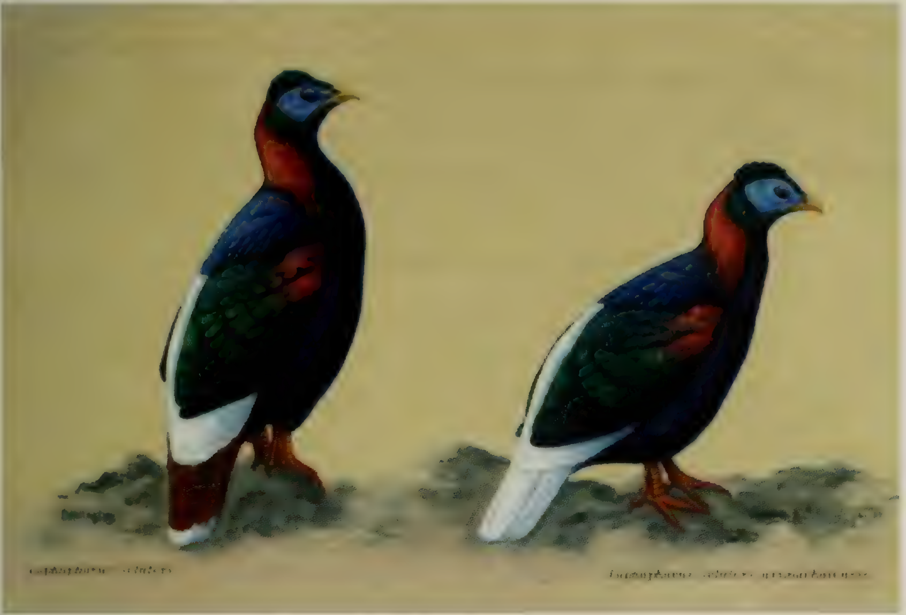
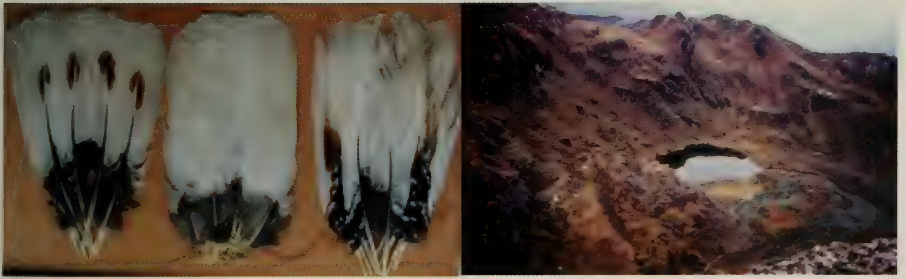


Figure 2.a. The new Sclater's Monal subspecies *Lophophorous sclateri arunachalensis* (right) compared with nominate Sclater's Monal (*L. s. sclateri*). Oil painting by Debasis Kabasi and R. Suresh Kumar.



b. Rectrices of male monals showing indications of possible intergradation with *Lophophorus sclateri*. Shown on left is the Taksing form, centre *L. s. arunachalensis* subsp. nov. and right Polosung form.

c. The alpine meadow habitat where the new subspecies was found (*c*.4,100 m).

and female monal were spotted by them at 3,800 m. Interestingly, complete rectrices of a male monal from Polosung had a slight chestnut splash along the outer margins of the two outermost feathers, which initially was mistaken for blood stains (Fig.2b).

12 January 2000. Redding village close to Taksing border post, Upper Subansiri District. A set of rectrices of a male monal was obtained from a hunter that appeared to be a possible intergrade between the white-tailed bird and Sclaters's Monal: 11 of the 16 feathers had small chestnut spots at the centre of each vane close to the terminal end (Fig.2b). It is not known whether or not these rectrices belong to an immature male of *L. s. sclateri*. No other rectrices were found showing indications of intergradations or consistent variation according to geographical position.

Determination of the subspecies

In 2001, SKR examined 38 skins of *L. sclateri* (Appendix) along with other monal skins in several museums (see Acknowledgements). Only at the Bombay Natural History Society (BNHS) was it possible to compare directly the material collected from white-tailed monals with specimens of *L. sclateri*. In all other museums a series of photographs was compared with Sclater's specimens (including the holotype at BMNH). On examination, the white-tailed form was found to resemble *L. sclateri* in morphology and overall plumage coloration, except for the white tail in the male and the overall darker plumage in the female. Furthermore, plotting the known ranges of the two forms (Fig. 1) revealed that white-tailed birds do not appear to be completely geographically isolated from *L. sclateri*, as no significant geographical barriers were found. Given the lack of essential evidence on reproductive isolation, in the form of information on vocalizations, behaviour and genetic make-up, we propose the recognition of the white-tailed form as a subspecies of *L. sclateri* under the Biological Species Concept.

Lophophorus sclateri arunachalensis, subsp. nov.

Holotype Bombay Natural History Society (BNHS) No. 28946, adult male from Wasi camp close to Pakdhung, Sarli, Lower Subansiri District, Arunachal Pradesh, approx. 28°05'N 93°07'E, India; collected by Suresh Kumar R. from local people who killed the bird for food on 8 November 1999 at 3,800 m in the alpine scrub zone.

Paratypes BNHS No. 28948, adult female and BNHS No. 28947, immature male from Wasi camp, Sarli, Lower Subansiri District, Arunachal Pradesh, approx. 28°05'N 93°07'E, India; collected by Suresh Kumar R. from local people who killed the birds for food on 26 October 1999 at 3,750 m in the alpine scrub zone.

Diagnosis A large, sexually dichromatic typical monal (*Lophophorus*) resembling *Lophophorus sclateri* (Fig. 2a). The presence of curly crown feathers in the male, which is a feature distinctive of *L. sclateri*, is a clear indication of the relatedness of these two forms. The two other species, *L. impejanus* and *L. lhyusii*, differ in size and have a crest of spatulated and elongated feathers respectively, as well as other differences. Both sexes of *L. s. arunachalensis* are very similar to nominate *sclateri* in size (Table 1), bare-part coloration, and plumage pattern and coloration. However, the male differs in having a completely white tail, unlike the chestnut tail with a white subterminal band in nominate *sclateri*. The female differs from nominate *sclateri* largely in having darker overall plumage with other minor differences. Only one female Sclater's Monal skin (BMNH: 1938.12.13.454) closely resembles the subspecies in overall coloration, although with minor differences in the tail colour pattern.

Description Plumage colour matching was made using Smithe (1975) under natural light. Both the male and female of the subspecies *arunachalensis* were considered adults based on their plumage and bright coloration of the bare parts.

Adult male (holotype). The highly iridescent plumage coloration of the head, neck, back, scapulars and wings, and the velvety black ventral coloration resemble that of nominate *sclateri*. The only feature that distinguishes the two is the white tail

TABLE 1

Comparison of morphometrics [mean ± s.d., n (range)] for measurements (mm) of both sexes of *Lophophorus sclateri arunachalensis* subsp.nov., *L. s. sclateri* (specimens listed in Appendix), *L. lhuysii* and *L. impejanus*. The mensural data could not be statistically tested due to insufficient sample size (for male and female *aruncahalensis* is n=1), but measurements of *L. s. arunachalensis* fall within the range of the nominate form. All measurements except the wing and tail were taken using a vernier calliper.

Variable	Male				Female			
	sclateri arunachalensis	*sclateri sclateri*	*lhuysii*	*impejanus*	*sclateri arunachalensis*	*sclateri sclateri*	*lhuysii*	*impejanus*
Beak length from skull	-	-	-	-	52.8	48.8 ± 4.0, 7 (43.3–53.9)	56.2 ± 0.0, 2	49.5 ± 3.4, 13 (44.1–55.4)
Beak length from skin	33.1	34.2 ± 1.1, 12 (32–36.7)	48.5 ± 4.1, 10 (44.0–56.3)	37.0 ± 2.5, 16 (31.4–40.9)	32.9	31.8 ± 2.2, 8 (27.5–34.8)	43.6 ± 4.2, 3 (39.3–47.7)	34.6 ± 1.3, 14 (31.9–36.4)
Beak length from nares	29.8	31.2 ± 1.0, 12 (29.4–32.1)	38.6 ± 3.7, 10 (29.3–41.4)	32.0 ± 1.6, 16 (29.6–34.5)	30.7	28.7 ± 2.0, 8 (25.8–32.0)	35.8 ± 2.3, 3 (34.3–38.4)	29.5 ± 1.0, 14 (27.6–31.1)
Wing length (flattened chord)	308	308.5 ± 9.9, 13 (297–327)	332.9 ± 7.5, 13 (319–342)	293.2 ± 6.9, 16 (284–310)	281	283.1 ± 9.6, 9 (269–298)	315.0 ± 6.1, 3 (311–322)	268.3 ± 8.2, 15 (257–284)
Tarsus length	76.6	77.1 ± 1.7, 12 (74.3–80.4)	80.0 ± 2.8, 12 (76.7–85.8)	71.4 ± 2.6, 17 (66.9–77.2)	64.1	67.7 ± 2.4, 9 (64.2–71.9)	76.6 ± 3.4, 3 (74.6–80.6)	65.6 ± 1.6, 15 (63.1–68.6)
Tail length	192	198.3 ± 10.1, 12 (181–211)	271.4 ± 14.8, 13 (250–295)	214.3 ± 21.6, 16 (154–243)	184	168.1 ± 11.3, 9 (149–185)	234.3 ± 13.3, 3 (219–243)	183.1 ± 10.1, 15 (167–203)

Beak length from skull—measured from the depression in the forehead (beak and head joint) to tip of the beak. Beak length from nares—measured from the anterior end of the nostril to the tip of the beak. Wing length—measured using a metal scale from the bend at the wrist region to the tip of the longest primary with wing pressed firmly. Tarsus length—measured from the depression in the tarso-metatarsial joint to the end of the tarsus.

coloration in *arunachalensis*, which is Chestnut (32) with a narrow subterminal white tail-band in the nominate *sclateri*. In *arunachalensis* a few feathers in the rump show faint brown central streaks whilst in nominte *sclateri* the central streaks are faint or dark closest to Dark Grayish Brown (20), in different individuals and in a few birds faint iridescent coloration on the streak is present. In the adult male the orbital skin coloration, when fresh, is bright blue, closest to Spectrum Blue (69); the legs are greenish-yellow; the beak is pale yellow; the iris coloration is not known; and the claws are dusky brown.

Adult female (paratype). Overall plumage coloration similar to nominate *sclateri* except that it is darker. Also differs in the lower back, rump and tail colour pattern. Lower back and rump coloration in *arunachalensis* is close to Olive Gray (42) but duller, with brown striations closest to Blackish Neutral Gray (82), whilst in nominate *sclateri* the coloration is dirty greyish-white, close to Smoke Gray (45), with thin wavy brown stripes closest to Olive Brown (28) and with faint cinnamon in a few places. Also the white streaks along the midrib in the rump feathers of *arunachalensis* is prominent compared to that of nominate *sclateri*. Tail coloration in the subspecies is closest to Blackish Neutral Gray (82) but darker, with thin irregular white wavy stripes and with very little lateral mottling compared to nominate *sclateri*, where the tail coloration is closest to Fuscous (21) but darker with very pale Cinnamon (39) wavy irregular stripes and with lateral mottling of Cinnamon (39) that appears to occur in distinct bands. The terminal end of the tail in *arunachalensis* is more broadly tipped with white than in nominate *sclateri*. In the adult female the orbital skin, when fresh, is bright blue closest to Spectrum Blue (69); the legs are pale greenish-yellow; the beak is pale yellow; the iris brown; and the claws dusky brown.

Immature male (paratype). Judged in its first-year (immature) plumage, and although not surgically sexed it was considered a male because a few iridescent bluish-green feathers were observed on the sides of the neck behind the ear-coverts. Overall appearance as in the female, although the brownish-black, closest to Blackish Neutral Grey (82), plumage coloration of the lower throat, breast and some parts of the belly distinguishes it. Also, unlike in the female, the lower back and rump plumage has a white background with prominent wavy terminal barring of dark brown closest to Blackish Neutral Grey (82), followed by finer wavy or mottled markings of the same. The tail is more broadly tipped with white than in the female. The orbital skin is much more extensive than in the female and is dotted with tiny black feathers; part of the forehead is featherless or with tiny black feathers as in the male; the lores have a sparse covering of tiny black feathers and small white feathers. In the immature monal the orbital skin, when fresh, is bright blue closest to Spectrum Blue (69); the legs are pale greenish-yellow; the bill is pale yellow; the iris is brown; and the claws are dusky brown.

Ecology and behaviour

Distribution *L. s. arunachalensis* has been seen by SKR only at the type locality in Lower Subansiri, Arunachal Pradesh. However, indirect evidence, in the form of tail feathers and interviews with local people, indicates that this subspecies occurs elsewhere in Lower Subansiri and in East and West Kameng Districts in the west of the state (Fig. 1), where previously nominate *sclateri* was assumed to occur. The subspecies *arunchalensis* there is restricted mainly to the high mountains of the main Himalayan Range along the India–China border. Local hunters reported not having seen this monal on the north side of the main range, which is largely dry and unlike the wet forested area in the south. Three major rivers, Kameng, Kurung and Kamala, originate here; the last two are tributaries of the Subansiri.

The precise eastern and western distribution limits of *arunachalensis* are not known. At the eastern end of its range there is a mountain range we call the 'Subansiri Divide'. This lies close to the Subansiri River that constitutes the district boundary between the Upper and Lower Subansiri Districts and probably acts as a barrier to some extent. The Divide may not, however, be an effective barrier because there are few high ridges. Nonetheless, nominate *L. sclateri* was found to occur only east of this Divide and the new subspecies only to the west, with the possible exception being around the Taksing area close to the Divide where the two may overlap. The western limit of the new subspecies's range appears to be along the Sela Range, which forms the district boundary between Tawang and West Kameng Districts. The subspecies may overlap here with *L. impejanus*. Towards the western end, the subspecies is probably rare, as few local people recognised it and those that did reported seeing it only occasionally. In parts of East Kameng and Lower Subansiri Districts, which are the stronghold of the new subspecies, *L. impejanus* appears to be absent.

Habitat At the type locality SKR observed *L. s. arunachalensis* in the alpine scrub and alpine meadows between 3,800 m and 4,200 m, whilst local assistants reported seeing the monal at 3,700 m in the temperate forests at the edge of the scrub zone. The alpine scrub is characterised by a few species of dwarf rhododendron *Rhododendron ciliatum*, *R. thomsonii*, *R. kaycei* and other unidentified *Rhododendron* spp., along with fir *Abies densa*, the last being the dominant tree species here, occurring up to 3,900 m. Also *Cassiope fastigiata*, and species of *Rubus*, *Berberis* and *Cotoneaster* are present along the treeline and alpine scrub. The ground cover is largely comprised of grass (*Agrostis* sp.); herbs and low shrubs were in the senescent stage during the survey. Most sightings of the monal in October 1998 were made in these high alpine areas (Fig. 2c). Oak *Quercus* sp., *Rhododendron* spp. and maple *Acer caudatum* dominate the temperate forest and are highly impenetrable because of a dense understorey of hill bamboo *Thamnocalamus spathiflorus* var. According to local hunters the monals descend from the alpine meadows to the temperate forests, down as far as 3,000 m during the winter. The mountain slopes on the whole are rugged and steep, with sheer drops straight down to the river in some places.

Vocalizations The earliest calling male was first heard at 0545 h when it was still twilight. The call was a series of double-noted, moderate- to high-pitched *koo(n)iak,* *kooo(n)iak, kooooo(n)iak*. The first note of the call is more of a whistle, wavering occasionally and ending in a cluck-like note. When flushed, three females and a male made a rapid *ki-ki-ki...kiyak, kiyak, kiyuk kvuk kvuk* in flight and, after alighting on a rock outcrop the male made the double-noted *koo(n)iak, kooo(n)iak, kooooo(n)iak* call for a while. Differences in vocalizations from nominate *sclateri* are not known because recordings of the latter were not available for direct comparison. Furthermore, the information available in the literature on the vocalization of Sclater's Monal is very sketchy.

Food The gizzard contents of three female, one immature male and one male *arunachalensis* collected from a hunter in Sarli, Lower Subansiri District, contained large number of small pebbles, roots, tubers, seeds and bark or leaf parts. The crop contents of a female contained leaves of *Potentilla* sp., *Cardamine* sp. and *Gaultheria* sp. On four occasions the birds were observed digging the ground. We searched for digging or scrape signs from where the birds were flushed. In a few of the dug-over areas there were remains of the underground bulb of the Cobra Lily *Arisaema* sp. It appeared that the birds fed on the inner fleshy part of the bulb. Local hunters reported using the bulb of *Arisaema* as bait in snares to trap the monal. Similar dug-over areas and scrape signs were observed at the type locality and at a few other sites.

Movements and behaviour At the type locality *arunachalensis* was found to be extremely shy; the birds flushed at the earliest notice and this was believed to be due to the high level of hunting in the area. However, on one occasion a male was observed calling from a ridgetop whilst three females and a male were feeding quietly further down the slope. On seeing us approach the feeding birds, the male started calling continuously instead of flushing and it only flushed after the birds below left the area.

Most females were in flocks of two or three, or with a single male. The female flocks however may have also consisted of subadults, which appear similar to adult females. Males were typically observed singly. A male appeared in the same area from where it had flushed either later in the day or on the next day, and if this was the same individual this may indicate some site-fidelity. Local hunters reported taking advantage of such predictable movements to place snares or set camps from which they could shoot birds. When flushed, the monals glided across or down the slope at great speeds and often to great distances, and on a number of occasions they flew down into the *Abies* forest in the alpine scrub area. According to local hunters, the monals leave the summer habitat of the alpine meadows and scrub by early October, when they move down to the alpine scrub that lies next to the temperate forest. They may descend even further.

Etymology This subspecies is named after the Indian state of Arunachal Pradesh, to which it is probably endemic. Emphasizing the name will further highlight the biological richness of the state, as well as drawing attention to the subspecies's restricted distribution. Arunachal Pradesh is renowned for its biodiversity and is listed among the 18 biodiversity hotspots of the world (Myers 1988, 1990). Ten of India's 17 species of pheasants are found in the state, more than any other.

Geographic differentiation As there is no marked difference in morphology and little deviation in plumage coloration from nominate *sclateri*, except for the all-white tail in the male, *arunachalensis* may not have been isolated long from the nominate form. Furthermore, information presented here on the distribution of the subspecies suggests that it is probably incompletely geographically isolated. Nevertheless, we believe that the Subansiri River, which flows close to the contact zone of the two or the adjacent mountain ridge that forms the district boundary between the Lower and Upper Subansiri districts, may have acted as a partial barrier.

It may be relevant that areas along the Himalaya that lie west of 93°E receive more rainfall than areas to the east (Ludlow & Kinnear 1944), and this coincides with the nominate subspecies's distributional limits, with the new subspecies to the west. Consequently, the difference in rainfall may have had an impact on habitat, and this in turn may have influenced geographic differentiation of the plumage coloration in the subspecies. In the genus *Lophophorus*, tail feathers play a major role during courtship display, where the tail feathers are held high and fanned out, and slowly flicked up and down (Gaston *et al.* 1982, Johnsgard 1986). Selection for conspicuousness of these feathers might have occurred in wetter, lusher vegetation.

Conservation *L. s. arunachalensis* is not currently threatened, because in most parts of its narrow range, especially in the interior, a large proportion of its habitat is so remote as to be intact. The habitat is affected very little by shifting cultivation or slash-and-burn agriculture, as this practice is confined to areas below 2,000 m, far below the subspecies's altitude range. Although the small geographic extent of the subspecies's range is of concern, the only current threat is hunting by local people. Even this may be marginal, because larger species such as Takin *Budorcas taxicolor* and Serow *Nemorhaedus sumatraensis* are preferred by hunters. The Nishi tribes, living in the East Kameng and Lower Subansiri Districts, consider the monal sacred and have certain taboos against hunting it. In a few areas, however, hunting is extensive and more and more people are using guns, which could possibly lead to local extinctions of the new subspecies.

The new subspecies may face some degree of risk as no part of its small range falls under any protected area designation. Moreover, hunting is difficult to curb, as it is a part of the culture of the tribes with which this taxon co-exists. Declaring a large protected area extending from Tawang to Lower Subansiri District, and ensuring that it is effective, is one way of improving the survival prospects of the subspecies, along with other threatened species such as Takin, Musk Deer *Moschus chrysogaster* and Red Panda *Ailurus fulgens*. More surveys to collect information on the exact distribution of the subspecies, and studies especially in the region of contact or overlap with both *L. s. sclateri* and *L. impejanus*, should be initiated to clarify the conservation status of the species.

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Appendix 1

List of *Lophophorus sclateri* specimens examined:

BNHS 13354: m; collected 1913; Hpinaw, between Kachin Hills & China; F. C. Louis. BNHS 13355: f; collected 1913; Hpinaw, between Kachin Hills & China; F. C. Louis. BNHS 13356: f; collected 1914; Htawgaw, between Kachin Hills & China; F. C. Louis. BNHS 13357: m; collected 9.3.1913; Tsu River, Mishmi Hills, Assam (*c*.2,120 m); Capt. F.M. Bailey. BNHS 13358: m; collected 1913; Tsu River, Mishmi Hills, Assam (*c*.2,120 m); Capt. F.M. Bailey. NMNH 328067: m; Delei Valley, Mishmi Hills (*c*.2,425 m), Upper Burma; brought by Mishmis. NMNH 328068: m; collected 4.4.1927; Delei Valley, Mishmi Hills; T.P.M. O'Callaghan. NMNH 608867: m; collected January 1, 1947; Mishmi Hills, N.E. Assam; S.D. Ripley. YPM 42186: f; collected 4.2.1927; Furzz, Delei Valley, Mishmi Hills; brought by Digaru Mishmis. YPM 42187: m; Upper reaches of the Don river, East of Sadiya, Assam, India (*c*.2,120 m); T.P.M. O' Callaghan. AMNH 543101: m; collected August 1925; Shweli-Salween Divide, N.W. Yunnan (*c*.3,330 m, rocky and ravine slopes); G. Forrest. AMNH 543102: Juvenile m; collected September 1925; Shweli-Salween Divide, N.W. Yunnan (*c*.3,640 m, rocky and ravine slopes); G. Forrest. AMNH 543103: m; collected August 1925; Shweli-Salween Divide, N.W. Yunnan (*c*.3,330 m, rocky and ravine slopes); G. Forrest. AMNH 543104: m; collected August 1925; Shweli-Salween Divide, N.W. Yunnan (*c*.3,330 m, rocky and ravine slopes); G. Forrest. AMNH 543105: m; collected September 1925; Shweli-Salween Divide, N.W. Yunnan (*c*.3,330 m, rocky and ravine slopes); G. Forrest. AMNH 543107: f; collected September 1925; Shweli-Salween Divide, N.W. Yunnan; G. Forrest. AMNH 543108: m; collected 26.5.1913; Yonggyap Latsa (Abor or Mishmi hills, *c*.3,480 m), Capt. F. W. Bailey. MCZ 149255: m; collected August 1925; Shweli-Salween Divide, N.W. Yunnan (*c*.3,330 m). Forrest. NHM 1871-12-1-1 (Type Specimen): m; died on 12.11.1871 in the Zoological Society's Gardens, Regents Park, London; collected from Mishmi Hills, Upper Assam; brought by locals to T.C. Jerdon. NHM 1889-5-10-1953: m; collected December 1879; Mishmi Hills, N.E. Assam; Hume Collection (Sir S. Bayley). NHM 1895-7-14-730:f; collected possibly 1879; Eastern Assam, India; Lt. Col. H.H. Godwin-Austen. NHM 1914-10-5-1: m; collected 24.3.1913; Tsu River, Mishmi Hills, N.E. Assam (*c*.2,360 m); Capt. F.M. Bailey. NHM

1925-5-8-1: f; collected 14.12.1924; Tsangpo Gorge (Po Tsangpo confluence), Tibet (*c*.2,725 m); F. Kingdon Ward (P). NHM 1925-5-8-2: Immature m; collected 14.12.1924; Po Tsangpo, Tibet (*c*.2,725 m); F. Kingdon Ward. NHM 1928-7-14-3: m; collected October 1925; Myitkyina district, Upper Burma; Mrs. M. West (P). NHM 1928-7-14-4: m; collected October 1925; Myitkyina district, Upper Burma; Mrs. M. West (P). NHM 1933-11-13-25: m; collected Jan–Feb 1931; Koi Tou Tengyeuh, N.W. Yunnan, China; G. Forrest. NHM 1933-11-13-26: f; collected Jan–Feb 1931; Koi Tou Tengyeuh, N.W. Yunnan; G. Forrest. NHM 1938-12-13-454: f; collected 14.5.1938; Lo La (South) Pachakshiri, S.E. Tibet (*c*.3,480 m); F. Ludlow & G. Sherriff. NHM 1938-12-13-455: m; collected 15.5.1938; Lo La (South) Pachakshiri, S.E. Tibet (*c*.3,480 m.); F. Ludlow & G. Sherriff. NHM 1938-12-13-456: m; collected 14.5.1938; Lo La (South) Pachakshiri, S.E. Tibet (*c*.3,480 m); F. Ludlow & G. Sherriff. NHM 1938-12-13-457: m; collected 15.5.1938; Lo La (South) Pachakshiri, S.E. Tibet (*c*.3,480 m); F. Ludlow & G. Sherriff. NHM 1938-12-13-463: f; collected 15.5.1938; Lo La (South) Pachakshiri, S.E. Tibet (3,485 m); F. Ludlow & G. Sherriff. NHM 1938-12-13-605: m; collected 14.5.1938; Lo La (South) Pachakshiri, S.E. Tibet (*c*.3,480m); F. Ludlow & G. Sherriff. NHM 1941-12-1-673: m; collected May 1934; 18 miles ENE of Hpinaw, Myitkyina-Yunnan border, Upper Burma (*c*.3,780–3,940 m); G. W. Whittall. NHM 1948-27-18: m; collected 20.2.1947; Trulung, Po Tsangpo Valley, S.E. Tibet (*c*. 2,880 m); F. Ludlow (P). NHM 1948-34-1: m; collected 28.3.1948; Chimli Pass, Burma (*c*.3,180 m); B.E. Smythies (P). NHM 1948-34-2: f; collected 29.3.1948; Chimli Pass, Burma (*c*.3,180 m); B.E. Smythies (P).

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Notes on breeding birds from an Ecuadorian lowland forest

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The lowlands of eastern Ecuador are popular for birdwatching tours as well as ornithological research. Despite this, and the increased interest in the Ecuadorian avifauna in the past 15 years (e.g. Krabbe 1992, Best *et al.* 1993, Rasmussen *et al.* 1996, Ridgely & Greenfield 2001), little has been written concerning the breeding biology of birds in the area (but see Greeney 1999, Hill & Greeney 2000, Greeney *et al.* 2000). As a whole, the natural history, ecology and breeding biology of tropical birds remains poorly understood (Hilty 1994). Here we present data on 32 species, collected over recent years, from two adjacent field sites in the Sucumbios province of eastern Ecuador. Observations were made opportunistically, during the course of other activities, and on their own are not useful for acessing patterns of seasonality. Nonetheless, in conjunction with past and future observations, the data presented here make a significant contribution to our knowledge of birds from this poorly studied area of Ecuador.

Sacha Lodge Research Station (SLRS) (00°26'S, 76°27'W) is located near the community of Añangu, *c*.65 km east-southeast of Coca along the Napo River at an elevation of 250 m. La Selva Biological Station (LSBS) (00°29'S, 76°22'W) is located only 10 km further downriver from SLRS. Both of these sites are located on the north bank of the Napo River, but nests were found on both sides. As the Napo River is thought to be the limit of distribution for some species (Ridgely & Greenfield 2001), the specific side is give with each observation as N (North) or S (South). Nesting records are given in taxonomic order following Ridgely & Greenfield (2001).

Species accounts

RUFESCENT TIGER-HERON *Tigrisoma lineatum*
10 March 1998, LSBS (N). The nest, typical of this species, was a loose stick platform located 3 m up in a mangrove tree over the edge of an oxbow lake. Whilst the contents of the nest were not seen, adult behaviour suggests the bird was incubating. Breeding information from Colombia includes breeding condition birds from March to November (Hilty & Brown 1986, Olivares 1974). Stiles & Skutch (1989) described an egg from Suriname and nests have been recorded in Venezuela from July to September (Thomas 1979).

BLACK VULTURE *Coragyps atratus*
1 April 1998, LSBS (N). An adult was found incubating two pale blue eggs with dark brown splotches. The nest was a shallow depression located at the base of a large *Ceiba* (Bombacaceae) tree, between two large buttressing roots. This species nests from January to May in Panama (Wetmore 1965) and November to February or March in Costa Rica (Stiles & Skutch 1989). Nests with young have been reported from Colombia in April (Hilty & Brown 1986) and at LSBS in June (Hill & Greeney 2000). Whilst this observation, and all the nesting records cited above, reported nests on the ground in similar sheltered positions, Howell & Webb (1995) reported this species breeding communally in tall trees.

SLENDER-BILLED KITE *Rostrhamus hamatus*
25 July 2001, SLRS (N). The nest was located *c.*25 m up in the outer mid-crown of a large tree in floodplain forest. Both adults were present and vocal around the nest but the contents of the nest were unobservable. Similar nests were described from Suriname (Haverschmidt 1968) and Venezuela (Hilty & Brown 1986, Mader 1981) in July and August to September respectively.

DOUBLE-TOOTHED KITE *Harpagus bidentatus*
24 April 2001, SLRS (N). On this date an adult bird was first seen building a loose stick platform in the horizontal fork of a *Ceiba* sp. (Bombacaceae) tree *c.*35 m above the ground in the swampy clearing in *terra firme* forest. On 23 August 2001 an adult was seen sitting for long periods on the nest, presumably incubating. During subsequent visits, until 6 September 2001, the birds were continuing to incubate. On one occasion the adult repeatedly called whilst sitting on the nest. The other adult flew in and displaced several Boat-billed Flycatchers *Megarhynchus pitangua* that were perching in the nest tree. Double-toothed Kites have been reported nesting

during June in Panama (Laughlin 1952), building during April in Costa Rica (Stiles & Skutch 1989), and in breeding condition from January to April in Colombia (Hilty & Brown 1986, Olivares 1962).

ORNATE HAWK-EAGLE *Spizaetus ornatus*

18 March 2001, SLRS (N). A single nest was found *c.*30 m above the ground in a *Ceiba* sp. (Bombacaceae) tree growing in *terra firme* forest. The nest was a loosely constructed stick platform *c.*1 m in diameter. An adult was sitting on the nest at 1200 h and was presumed to be incubating. On 18 April an adult was seen bringing food and at least one nestling could be seen. This species is known to breed from November or December to May in Panama (Brown & Amadon 1968), from March to June in Guatemala (Lyon & Kuhnigk 1985), and from April to May in Costa Rica (Stiles & Skutch 1989).

MARBLED WOOD-QUAIL *Odontophorus gujanensis*

24 December 1997, LSBS (N). One adult was seen inside *terra firme* forest with at least two dependent chicks. When approached, the chicks quickly nestled into the leaf litter and froze. The adult ran just out of sight and circled around calling continuously. In Colombia, breeding condition birds have been recorded from February to May, a nest with eggs from March, and chicks from April (Blake 1955, Hilty & Brown 1986). In Costa Rica this species breeds from January to August (Skutch 1947, Stiles & Skutch 1989).

COLLARED PLOVER *Charadrius collaris*

15 March 2001, SLRS. A simple scrape nest was found on an island in the Napo River. It was *c.*20 m from the river edge, *c.*5 cm deep, and located at the base of a small tuft of grass. There was a single egg. When the nest was approached, the adult engaged in a broken-wing display. This species breeds from March to June in Costa Rica (Stiles & Skutch 1989). Chicks have been reported in January from Venezuela (Friedmann 1948) and a summary of their breeding in Chile was given by Johnson (1965).

RUDDY QUAIL-DOVE *Geotrygon montana*

27 November 2000, SLRS (N). An adult was found incubating two buff-coloured eggs, measuring 24.7 mm x 20.7 mm and 26.3 mm x 20.7 mm respectively. The nest was a loose stick and leaf platform on the top of a 60-cm-high stump in *terra firme* forest. It measured roughly 19 cm across on the outside, with the 2-cm-deep cup being 8 cm wide. 25 March 2001, SLRS (N). An adult was seen near a nest with two nestlings at 1000 h. The nest was as previously described, located 2 m up in the U of a liana against the side of a large tree in *terra firme* forest. In Colombia, breeding-condition birds were reported from January to June and a nest with eggs in March (Hilty & Brown 1986, Olivares 1964). Greeney (1999) reported two nests with eggs at LSBS in January.

COBALT-WINGED PARAKEET *Brotogeris cyanoptera*
30 April 1998, LSBS (N). A single adult was observed inside *terra firme* forest excavating a small hole in the side of an arboreal termite (*Nasutitermes* sp.) nest *c*.5 m above the ground. 29 July 1998, LSBS (N). A second nest hole, located 6 m up, and also in a termite nest, was seen being entered by a single adult. Nestling begging could be heard but the contents were not seen. Hilty & Brown (1986) reported breeding-condition females in early June from Colombia, but little else seems to have been published on the breeding of this species.

COMMON POTOO *Nyctibius griseus*
2 September 2001, SLRS. A nest was found on a river island *c*.2.5 m above the ground at the end of a broken *Cecropia* sp. (Moraceae) stump. At least one nestling was seen. It was sparsely feathered with white down. The breeding of this species is fairly well known (del Hoyo *et al.* 1999).

RUFOUS-BREASTED HERMIT *Glaucis hirsuta*
28 July 2001, SLRS (S). Both sexes were seen building a nest attached to the back of an epiphytic fern leaf hanging 1.5 m over a small river. The nest, similar to those of other Phaethorninae, was a small, inverted cone-shaped nest attached with spider webs. This species appears to nest year-round in Colombia (Hilty & Brown 1986) and accounts of breeding behaviour in Colombia have been presented by Todd & Carriker (1922) and Darlington (1931). Snow & Snow (1973) described the breeding of this species in Trinidad.

GREAT-BILLED HERMIT *Phaethornis malaris*
5 August 1998, LSBS (S). An unsexed adult was found incubating two all-white eggs. The nest was an inverted-cone cup fastened to the underside of an understorey palm frond in typical *Phaethornis* fashion. We have found no other breeding records for this species but the Ecuadorian population has previously been considered a subspecies of Long-tailed Hermit *P. superciliosus* (Meyer de Shauensee 1970) and is now considered separate (Hinkelmann 1996, Hinkelmann & Schuchmann 1997). For *P. superciliosus*, breeding data have been reported from Colombia, Costa Rica and Panama (Hilty & Brown 1986, Skutch 1964, Stiles & Skutch 1989, Wetmore 1968, Willis & Eisenmann 1979).

FORK-TAILED WOODNYMPH *Thalurania furcata*
25 July 2001, SLRS (S). An adult female was flushed from the nest and was found to be incubating two all-white eggs. Subsequently, on 9 August, the nest contained two nestlings and the female was observed brooding. The nest was a small cup located 2.5 m up in an epiphytic fern on a small tree. Little has been published on the breeding of this species, but Hilty & Brown (1986) reported breeding-condition birds from Colombia in June.

BLACK-FRONTED NUNBIRD *Monasa nigrifrons*
15 August 2001, SLRS (N). One adult was seen excavating a nest cavity *c.*35 cm up in a *c.*50-cm-high sandy bank in heavily disturbed flooded forest beside the Napo River. In Colombia, breeding condition birds have been reported in June and a stub-tailed juvenile in November (Hilty & Brown 1986). O'Neill (1974, in Hilty & Brown 1986) reported this species breeding during the dry season in south-eastern Peru. At LSBS this species was previously reported nesting in April (Hill & Greeney 2000).

YELLOW-TUFTED WOODPECKER *Melanerpes cruentatus*
2 April 1998, LSBS (N). Both adults were seen bringing food to nestlings in a cavity inside a dead palm (*Mauritia* sp.) beside an oxbow lake. Nests and the breeding activity of this species have been described from Peru (Short 1970). Olivares (1962) reported a bird in breeding condition from Colombia in March.

ORANGE-FRONTED PLUSHCROWN *Metopothrix aurantiacus*
27 July 1998, LSBS (N). On this date, at least five individuals were seen following each other into and out of two different nests located in the same tree. A third nest was also located in this same tree. The nests were large bulky balls of sticks, located *c.*30 m above the ground in open floodplain forest along the Napo River. There is apparently very little known concerning the breeding biology of this species, although the nest was generally described in Ridgely & Greenfield (2001).

TAWNY-THROATED LEAFTOSSER *Sclerurus mexicanus*
1 August 1998, LSBS (N). An adult was seen bringing pale, skeletonised leaves to an excavated hole in the soil surrounding the roots of an upturned tree. The nest burrow was 1 m up and, beyond a 4-cm tunnel, opened into a cavity roughly 20 cm in diameter. The cavity was lined entirely with skeletonised leaves. This species nests from December to April in Costa Rica (Stiles & Skutch 1989) and breeding condition birds have been reported in Colombia from April and May (Hilty & Brown 1986). The nests described by Stiles & Skutch (1989) from Costa Rica had smaller chambers and longer entrance tunnels than the nest observed here. That described here, however, is similar to the nests of Black-tailed Leaftosser *S. caudacutus* and Short-billed Leaftosser *S. rufigularis*, which both nest in burrows built in upturned roots in French Guiana (P.R. Martin, pers. comm.).

FASCIATED ANTSHRIKE *Cymbilaimus lineatus*
26 June 2001, SLRS (N). In an area of flooded forest, both sexes were seen bringing material to a nest located 1.5 m up in a tangle of vines and undergrowth. The nest was fairly unformed at this time. Adults were seen carrying spider silk, bark strips and a small vine with green leaves. Both sexes alternated weaving material into the nest whilst giving muted calls. On 12 July they were still building. On 20 July the male was flushed from the nest and found to be incubating one egg. The egg was white with large brown blotches. At the time of the last observation, on 29 July, the

male was still incubating a single egg. This species has been reported to breed from April to June in Costa Rica (Stiles & Skutch 1989) and birds in breeding condition were reported in Colombia from March to May (Hilty & Brown 1986). Previous nest descriptions, loosely woven cups of dark fibers, suspended by the their rims in a horizontal fork, resemble the nest found here (Skutch 1972, Stiles & Skutch 1989, Wetmore 1972) and those seen in French Guiana (P.R. Martin pers. comm.).

DUSKY-THROATED ANTSHRIKE *Thamnomanes ardesiacus*
16 August 2001, SLRS (N). At 1445 h, an unsexed adult was flushed from the nest and found to be incubating two eggs. The eggs were pale reddish-cream with even, dark red-brown speckling, except for a distinctly heavier wreath around the larger end. They measured 22 x 16 mm. The nest, at the top of a small hill inside primary forest, was located *c.*1.75 m up in a small, semi-herbaceous tree (Rubiaceae), suspended between the horizontal petioles of two large leaves. It was an open cup-type nest constructed of dark fibres, leaves and small sticks. The cup was slightly 'squashed' and measured 5.5 x 7.0 cm on the inside and 7.0 x 9.0 cm on the outside. The cup was 5.5 cm deep and the nest 9.0 cm tall overall. The nest was visited a total of eight times up to 29 August, when the eggs still had not hatched. Of the occasions when the sex of the incubating adult was determined, the female was seen five times and the male once. On 3 September the nest contained two unfeathered nestlings and on 6 September the chicks were seen to be well covered with down. The nest and eggs described in Hilty & Brown (1986) from Peru appear to match the description given here.

WHITE-SHOULDERED ANTBIRD *Myrmeciza melanoceps*
4 March 1998, LSBS (N). The female was encountered incubating two creamy-buff eggs with red-brown speckling, heaviest at the larger end. They measured 28 x 19 mm and 28 x 18 mm respectively. The nest was a globular ball with a round side entrance and constructed from strips of palm fronds and other dead leaves. Outside dimensions were roughly 16 cm high x 24 cm wide. The entrance was 6 cm high x 9 cm wide with a broad lip extending out 10 cm and 13 cm wide. The nest was located 30 cm above the ground, nestled into the base of a palm seedling in an area of *várzea* forest, *c.*750 m from the edge of the Napo River. During subsequent visits to the nest, until 31 March 1998 when the nest was found destroyed, both the male and female were noted to incubate. On one occasion, the male showed a broken-wing display when flushed from the nest. Little is known of the breeding habits for this species but Hilty & Brown (1986) reported breeding-condition birds in June from Colombia.

PYGMY ANTWREN *Myrmotherula brachyura*
26 July 1998 LSBS (N). Both adults were seen building a hanging cup nest *c.*12 m up in the outer branch of a large tree growing in open floodplain forest. The nest was mostly hidden by the leaves of the tree in which it was constructed. Hilty & Brown

(1986) reported a single breeding condition bird in April from Colombia and a nest being built 6 m up in flooded forest in Brazil at the end of August.

DWARF TYRANT-MANAKIN *Tyranneutes stolzmanni*
15 April 2001, SLRS (S). One nestling was discovered in a tiny, sparse black rootlet cup suspended from a horizontal fork 1.5 m up in a small sapling inside *terra firme* forest. The nest was 5 cm in diameter on the outside with a 3 cm deep x 3.5 cm diameter cup. Previously reported breeding data included breeding condition birds from Colombia in May and March (Olivares 1962, 1964).

CHESTNUT-CROWNED BECARD *Pachyramphus castaneus*
15 March 1998, LSBS (N). Adults were seen entering a nest with food. The ball nest was wedged in the branches of a tall *Ceiba* sp. (Bombacaceae) tree, *c.*35 m above the ground. Breeding condition birds and a juvenile were reported from Colombia in May (Olivares 1964) and two similar nests were described from eastern Ecuador in July (Hilty & Brown 1986).

WHITE-WINGED BECARD *Pachyramphus polycopterus*
27 July 1998 LSBS (N). An adult female was seen feeding a juvenile a katydid (Tettigoniidae) in an open floodplain forest along the Napo River. 24 August 2001, SLRS. Both sexes were seen around a globular ball nest *c.*15 cm diameter. The nest was located in a tree, 8 m above the ground, along the Napo River in an area of second growth. The male was seen going to the nest later that afternoon, but we do not know what stage the nest was in. Breeding condition adults have been recorded from May to August in Colombia, as well as nest-building activity in March and June (Hilty & Brown 1986). Breeding in Costa Rica occurs from April to August (Stiles & Skutch 1989).

PINK-THROATED BECARD *Platypsaris minor*
26 June 2001, SLRS (N). An adult male was observed bringing material to a bulky, suspended, mossy ball nest. The female was nearby and both adults were vocal. The nest was located in primary forest near a recently fallen tree, *c.*20 m up on a dead snag. 23 August 2001, SLRS. Another nest was observed under construction. Both adults were seen going to the nest and the male was observed carrying soft plant fibres. The nest was being built 10 m above the ground inside the infructescence of an unidentified palm tree in *várzea* forest. On 3 September the nest was found to be torn down but both adults were in the area. There is apparently little published on any aspect of the breeding ecology of this species.

BLACK-TAILED TITYRA *Tityra cayana*
21 July 2001, SLRS (N). An adult female was seen bringing food to an unknown number of nestlings. The nest was located *c.*5 m up in the cavity of a dead tree located in an area of cow pasture near the Napo River. In Colombia, breeding

condition birds have been reported from June and active nests in March, July and November (Hilty & Brown 1986). At LSBS, an active nest was previously reported in March (Hill & Greeney 2000).

DOUBLE-BANDED PYGMY-TYRANT *Lophotriccus vitiosus*
24 August 2001, SLRS (S). An adult was flushed from a nest with two eggs. The eggs were pale buff with sparse brown flecking. The nest was a hanging ball of thin fibres and moss with a side entrance. It was located *c.*1 m above the ground in a small *Piper* sp. (Piperaceae) tree, in an area of second growth. Nests were previously reported in September in Suriname and building birds in August from Brazil (Hilty & Brown 1986).

YELLOW-BROWED TODY-FLYCATCHER *Todirostrum chrysocrotaphum*
22 July 1998, LSBS (N). An adult was seen lining a hanging globular nest with soft kapok seed down (*Ceiba* sp.). The nest was *c.*35 m up in a large *Ceiba* sp. tree. 10 September 2000, SLRS. One adult was seen bringing kapok down to a hanging globular ball nest located *c.*40 m up in the *Ceiba* sp. tree where the lodge has built a canopy observation tower. 4 April 2001, SLRS (N). Both sexes were seen building a different nest located in the same tree. On 10 April, presumably the same pair had abandoned that nest and begun construction of another on the opposite side of the tree's crown. The second site chosen was *c.*1 m away from a paper wasp (Vespidae) nest. This pair constructed until at least 20 April. Then, on 29 May one adult was seen bringing food to the nest. 22 July 2001, SLRS (N). Yet another nest was seen being built in the same tree. This nest was being constructed only 30 cm from the same paper wasp nest. Only one adult was seen building, intermittently pausing to sing. Hilty & Brown (1986) reported a nest in a similar situation from eastern Ecuador in July and a Colombian nest in June was only 4–5 m up in an area of second growth. Proximity to wasp nests was not noted for either of these nests.

AMAZONIAN SCRUB FLYCATCHER *Sublegatus obscurior*
26 July 1998, LSBS (N). Both adults were seen around a nest under construction, but only one was seen to bring material. The nest was an open cup, suspended in the fork of a horizontal branch, *c.*8 m above the ground in an area of floodplain forest along the Napo River. A stub-tailed juvenile was reported in August and breeding condition birds from January and March in Colombia (Hilty & Brown 1986). Cherrie (1916) reported an active nest in April and ffrench (1973) described the nest and eggs from Trinidad.

WHITE-NECKED THRUSH *Turdus albicollis*
20 March 2001, SLRS (N). An adult was seen incubating two eggs in a cup nest located 2 m up in a small tree. Accounts of Colombian and Trinidad nests can be found in Todd & Carriker (1922) and Snow & Snow (1963).

RED-CAPPED CARDINAL *Paroaria gularis*
24 March 2001, SLRS (N). An adult was seen feeding a fledgling Shiny Cowbird *Molothrus bonariensis* along a small stream. The fledgling, begging continuously, followed the adult while it fed. On 24 August 2001 at SLRS (N), an open cup nest was found 4 m up in the fork of a small tree in an area of heavy human disturbance. From adult behaviour around the nest, it is presumed that they were incubating, but the nest contents were not seen. On 29 August the nest was found torn apart. Hilty & Brown (1986) reported a male in breeding condition and begging fledglings in June from Colombia. Breeding in Venezuela was reported from June to September (Cherrie 1916, Thomas 1979).

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New and noteworthy records of birds from the Sierra Nevada de Santa Marta region, north-eastern Colombia

by Ralf Strewe & Cristobal Navarro

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The Sierra Nevada de Santa Marta is an isolated pyramid-shaped massif on the Caribbean coast of north-east Colombia close to the border with Venezuela. The twin snow-covered peaks. Pico Simon Bolivar and Pico Cristobal. reaching an altitude of 5.775 m just 46 km from the Caribbean coast. represent the world's highest coastal massif. Because of its altitudinal variation as well as its location. the region contains a mosaic of globally significant biomes (nearly all those to be found in tropical America) from mangroves. semi-deserts. tropical dry forests and tropical wet forests. montane forests and páramos: the region is unique for its small size (*c.*11.000 km^2) combined with its large variety of habitats.

Recent studies by the authors during July 1999 to January 2003 on the biogeography and conservation of the avifauna within the Sierra Nevada de Santa Marta Endemic Bird Area (EBA 036) (Stattersfield *et al.* 1998) and the adjacent lowlands. including the Ciénaga Grande wetlands. has yielded noteworthy distributional records of 20 bird species. with one species new to Colombia. new registrations for the Caribbean and Sierra Nevada region. and noteworthy altitude extensions for 26 bird species. All 20 bird species with new distributional records were not recorded by Todd & Carriker (1922). who amassed intensive ornithological collections at the beginning of the 20th century over a period of several years and at different sites and elevations within the Sierra Nevada area. Following the latter study no other intensive investigations took place. and information on the avifauna of the Sierra Nevada was principally collected along the San Lorenzo Ridge in the vicinity of Santa Marta city.

Much of the information included in this paper results from avifaunal surveys within the study areas of the San Salvador Valley and Toribio Valley on the northern slope of the massif. concentrated at elevations below 2.000 m. The Toribio Valley (localities Haciendas El Recuerdo. Cincinati. Vista Nieve) encompasses humid montane and premontane forest. and tropical humid forest. in the lower valley. Below 500 m very little forest persists. as the land is intensively farmed and used for cattle grazing. At 500–1.800 m. the valley represents a mosaic of humid premontane forest fragments. shade-coffee plantations and pasture. Above 1.800 m still-larger forest fragments exist up to the San Lorenz ridge. The San Salvador Valley is characterized by extensive primary forests along an altitudinal gradient of 600 to 2.300 m. and isolated forest patches and secondary forest at elevations from sea level to 600 m (Strewe in press. a). Additionally. excursions were made to the western and southern slopes of the massif and to the National Parks Tayrona and Isla de Salamanca within the coastal region, where boreal migratory bird species in particular were monitored.

Data were collected during fieldwork within the project 'Habitat conservation of migratory and resident bird species in the Sierra Nevada de Santa Marta', conducted in 2000–2003 (Salazar & Strewe unpubl.). Study areas were visited monthly during excursions of 5–10 days. Bird populations were monitored using standardised methodologies for assessing bird population abundance (mist-netting [15x12 m], fixed-radius point counts, non-systematic field observations and tape-recordings). Birds were measured, photographed and selectively marked with colour rings. Tape-recordings, using a Sony TCM 5000 EV and Sennheiser ME66 microphone, were made on most days; copies of recordings have been deposited at Banco de Sonidos Animales (BSA), Alexander von Humboldt Institute, Bogotá.

The majority of records included herein were obtained at ten localities (Fig. 1):

(1) San Salvador Valley, located on the northern slope of the Sierra Nevada de Santa Marta, department of La Guajira (11°05'N, 73°35'W; 8,400 ha), including Buena Vista nature reserve (450 ha), which protects premontane forest at 600–2,300 m (Strewe in press, a).

(2) El Recuerdo (11°07'N, 74°06'), Cincinati (11°06'N, 74°05'W) and (3) Vista Nieve (11°05'N, 74°05'W), three private coffee farms in the foothills of the San Lorenzo ridge within the Toribio Valley (600–1,900 m), including wet premontane forest and shade-coffee plantations.

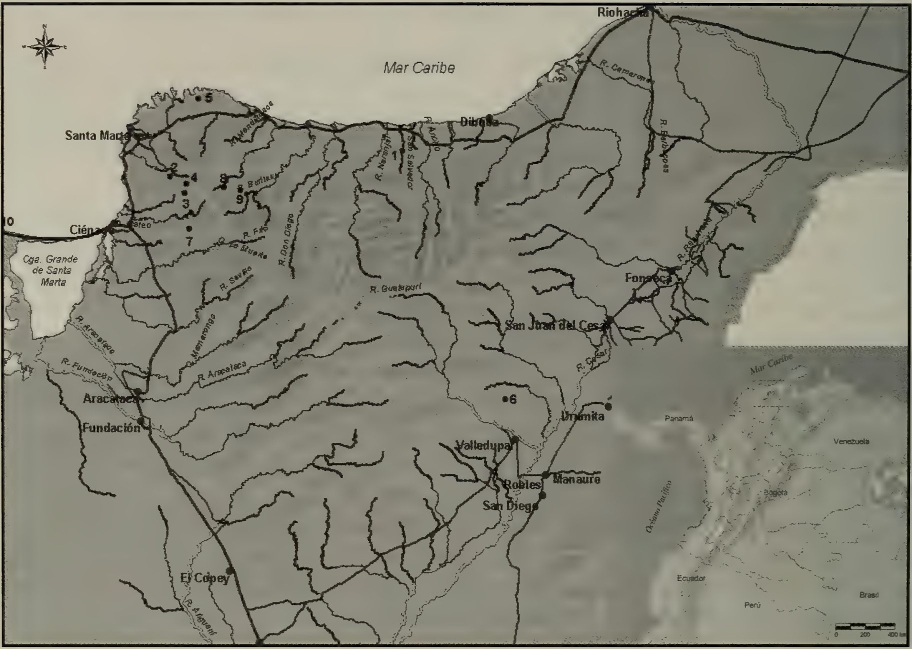
(4) San Lorenzo ridge (11°45'N, 78°58'W) in the vicinity of Santa Marta city includes wet premontane and montane forest at 1,800 to 2,800 m; primary forest still exists on the slopes of the ridge, whilst secondary forest and pine plantations dominate in the vicinity of the National Park Unit station and the military base.

(5) Tayrona National Park (11°18'N, 73°56'W), protecting *c.*15,000 ha of mangroves, dry tropical to humid tropical forest at sea level to 600 m. The park area includes disturbed and secondary habitats in the lower and plain sectors, and primary forest on the slopes and ridges.

(6) Los Besotes (10°31'N, 72°16'E), private nature reserve (450 ha), first-designated Colombian Important Bird Area (IBA) on the southern slope of the Sierra Nevada de Santa Marta, department Cesar *c.* 20 km north-east of the capital Valledupar, protecting primary forest at 300–2,000 m.

(7) El Congo (10°59'N, 74°04'W), nature reserve of Fundación Pro-Sierra Nevada (40 ha) on the western slope of the Sierra Nevada mountains protecting premontane forest at 600–1,050 m. At 500–1,800 m, the valley represents a mosaic of humid premontane forest fragments, shade-coffee plantations and pasture; above 1,800 m still-larger forest fragments exist (Strewe in press, b).

(8) Filo Cartagena (11°06'N, 73°69'W; 850 m) and (9) Alto de Mira (11°05'N, 73°56'W; 950 m), ecological stations at the limits of the Sierra Nevada de Santa Marta National Park within premontane forest. Primary forest around these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Ciénaga
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R. Frío
R. Don Diego
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R. Sevilla
R. Guatapurí
Fonseca
R. Ranchería
San Juan del Cesar
R. Cesar
R. Aracataca
R. Fundación
Aracataca
6
Fundación
Urumita
Valledupar
Robles
Manaure
San Diego
El Copey
R. Ariguaní
Mar Caribe
Panamá
Venezuela
Océano Pacífico
Bogotá
Ecuador
Perú
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Figure 1. Map showing the geographical locations of the Sierra Nevada de Santa Marta region. (1) Buena Vista nature reserve, San Salvador Valley, (2) El Recuerdo, (3) Vista Nieve, (4) San Lorenzo, (5) Tayrona National Park, (6) Los Besotes nature reserve, (7) El Congo nature reserve, (8) Filo Cartagena, (9) Alto de Mira, (10) Isla de Salamanca.

stations was visited only a few times, because of problems with working permits from indigenous communities in the area.

(10) Isla de Salamanca (10°59', 74°32'W) National Park (54,000 ha), limited in the west by the Magdalena river, the Caribbean Sea in the north and the Ciénaga Grande de Santa Marta, Colombia's largest lagoon and Biosphere and RAMSAR reserve, in the south. The National Park is protecting coastal lagoons and nearly undisturbed mangroves.

Species accounts

GREY TINAMOU *Tinamus tao*

This tinamou is rare and local in humid forest, principally in foothills; known from the Perijá Mountains and the upper Cesar Valley near Fonseca (Hilty 2002, Hilty & Brown 1986), where heavy destruction of the natural habitats has occurred (pers.

obs.). Individuals were heard at 2,100 and 2,400 m at San Lorenzo ridge in January 2003 (tape-recording), representing an altitudinal extension from 1,900 m (Hilty 2002, Hilty & Brown 1986). P. Coopmans registered the species at the same locality (*in litt.*).

BARE-THROATED TIGER-HERON *Tigrisoma mexicanum*

Known in Colombia from the extreme north-west in the lower Atrato and the Gulf of Urabá region (Hilty & Brown 1986). The observation of an adult (photo) at a mangrove border at Los Cocos, Isla de Salamanca National Park, on 15 October 2002, signifies a range extension of 410 km north-west.

SWALLOW-TAILED KITE *Elanoides forficatus*

The species is distributed throughout Colombia, except the dry Caribbean region from department Atlántico eastward (Hilty & Brown 1986). Within the study area individuals or small groups were recorded frequently across study sites from the period March to May, which may indicate that these were transients from Central America (Ferguson-Lees & Christie 2001, Hilty 2002, Hilty & Brown 1986).

BLACK-AND-WHITE HAWK-EAGLE *Spizastur melanoleucos*

This little-known raptor is patchily distributed across Colombia with only a handful of records in humid and wet forest. The closest geographical records are 150 km distant on the western slope of Serranía de Perijá and Río Cesar valley (departments of Guajirá and Cesar), with a recent record from the Serranía de San Lucas (Hilty & Brown 1986, Salaman *et al.* 2002). The species was discovered for the Sierra Nevada region within the upper San Salvador Valley. Observations of individuals within the Buena Vista nature reserve occurred on 8 July 2000, with an adult perching in an open canopy of premontane forest at 450 m, on 19 September 2000, an adult soaring at 1,200 m, and on 18 April 2001, with close views of an adult soaring over primary premontane forest at 800 m.

AMERICAN GOLDEN PLOVER *Pluvialis dominica*

An uncommon transient in Venezuela and Colombia with few spring records, at Buenaventura Bay in February 1984 and in April 1977 east Vichada (Hilty & Brown 1986, Hilty 2002). On 8 April 2001 three individuals were observed migrating north along a ridge at 3,800 m within the upper río Frio Valley.

PEARLY-BREASTED CUCKOO *Coccyzus euleri*

The species is distributed very locally in sandy-belt woodland, scrub and gallery forest in Suriname, Guyana, south-east Peru, east and south Brazil, and northern Argentina. It is known from one record on the Caribbean coast near Cartagena in January (del Hoyo *et al.* 1997, Hilty & Brown 1986). The new records for the study area come from the Tayrona National Park, sector Neguanje, in tropical dry forest, where an adult was observed at close range for several minutes on 1 May 1997, and

230 km from Cartagena, in the southern foothills of the Sierra Nevada Mountains, at 300 m within the Los Besotes nature reserve, where another adult was found in tropical dry forest on 23 May 2001 (observation with Bernabé Lopez-Lanus). The status and even the general distribution of this scarce cuckoo remain very poorly understood.

MANGROVE CUCKOO *Coccyzus minor*
This rare cuckoo is known from 'Bogotá' skins presumably from Colombia (Hilty & Brown 1986). In Venezuela the species is rare, with two specimens from Capure, northern Delta Amacuro (1966) and additional observations exist in Red Mangroves *Rhizophora mangle* at Caño Macareo, Delta Amacuro and from Islas Los Roques in June 1988 (del Hoyo *et al.* 1997, Hilty 2002). On 21 November 2002 two individuals were observed along the Santa Marta–Barranquilla road at a mangrove border within the Isla de Salamanca National Park (photo). Both individuals stayed low in Red Mangroves and vocalized a very nasal *aan aan aan aan aan urmm urmm*, slightly accelerating, with the last two notes lower and longer (per Sibley 2001).

COMMON POTOO *Nyctibius griseus*
The species is distributed patchily throughout Colombia, but without definite records from Santa Marta and the arid Caribbean region (del Hoyo *et al.* 1997, Hilty & Brown 1986). The first registrations for the Santa Marta region come from the Caribbean plain with a nest reported by locals at Casa Loma nature reserve, in April 1999, individuals calling at San Salvador Valley (250 m) on 10 March 2000, and at Vista Nieve (1,000 m) on 30 January 2003 (tape-recording).

CHESTNUT-COLLARED SWIFT *Cypseloides rutilus*
Known from all three Cordilleras and Serranía de San Lucas, but unrecorded in the Santa Marta or Perijá Mountains (Hilty 2002, Hilty & Brown 1986). Within the study area the species is not uncommon, with 22 registrations at elevations from sea level, at Rodadero, to 3,200 m in the río Frío Valley (altitudinal range extension from 600 m for Colombia; del Hoyo *et al.* 1999 mention records down to sea level). Additional records were of groups with up to 30 individuals from the San Lorenzo ridge at 2,800 m (tape-recording), from Cincinati and Vista Nieve (1,200 m), from the San Salvador Valley (100–800 m) and from El Congo on the western slope

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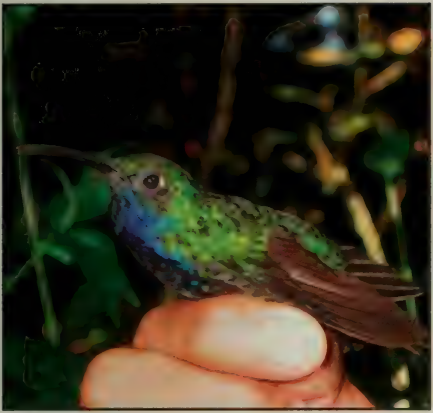
Figure 2 (on opposite page). Some examples of poorly known and rarely photographed birds from north-east Colombia.

a. Male Lazuline Sabrewing *Campylopterus falcatus* (Ralf Strewe)
b. Male Scaled Piculet *Picumnus squamulatus* (Ralf Strewe)
c. Ruddy Woodcreeper *Dendrocincla homochroa* (Ralf Strewe)
d. Zeledon's Tyrannulet *Phyllomyias zeledoni* (Ralf Strewe)
e. Male Coppery Emerald *Chlorostilbon russatus* (Ralf Strewe)
f. Female Rosy Thrush-tanager *Rhodinocichla rosea* (Ralf Strewe)



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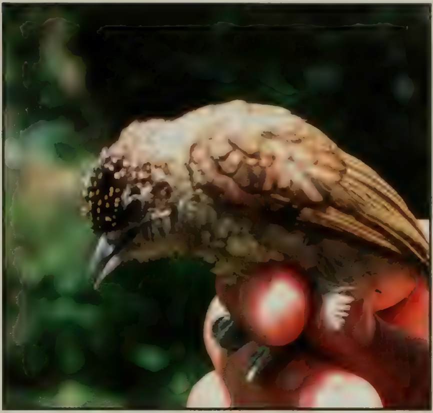

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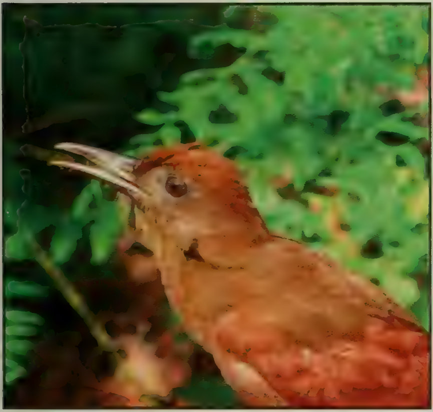

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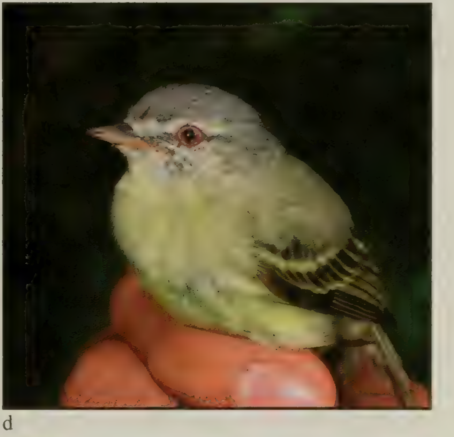

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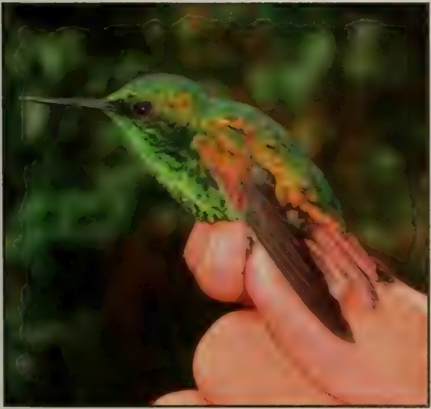

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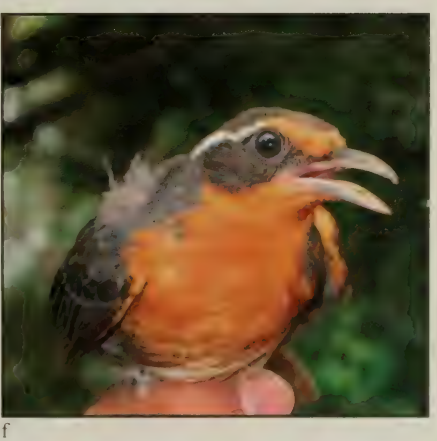

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(1,000 m). In June 2001 the presence of this species in Perijá Mountains was also confirmed at Cerro Pintado, La Guajira (pers. obs.).

GREY-RUMPED SWIFT *Chaetura cinereiventris*
Records for this species in northern Colombia are from the northern foothills of the West and Central Andes, in Antioquia and recently from both flanks of the Serranía de San Lucas (Hilty & Brown 1986, Salaman *et al.* 2002). An adult was caught at 850 m at Filo Cartagena on the northern slope in October 2000 (photo), representing the first record for the Caribbean region and Sierra Nevada Mountains. Additionally, the species was observed at El Congo with two individuals on 29 November 2000, in the río Frío Valley at 1,400 m in April 2001 and three times at El Recuerdo in September and October 2002.

LESSER SWALLOW-TAILED SWIFT *Panyptila cayenensis*
This swift is little known in Colombia with only one previous Central Cordillera record in Caldas, in the mid-Magdalena valley, and a pair observed in the Serranía de San Lucas in March 2001 (Hilty & Brown 1986, Salaman *et al.* 2002). In Venezuela the species is recorded below 1,000 m at the base of both slopes of the Andes in Táchira and Mérida, but not from the Perijá Mountains (Hilty 2002). New distributional records of the species come from the Tayrona National Park, at Calabazo (150 m) in January 2001, from El Recuerdo (800 m), from Vista Nieve (1,300 m) with four individuals in November 2002 (tape-recording), from Filo Cartagena (850 m) with ten individuals in October 2000, and from the San Salvador Valley (600 m), where a group of 22 individuals was registered in November 2000 and three nests found in December 2002 (photo). These nests were at 8–15 m from the ground on heavy tree trunks at forest borders or within natural clearings (elevations 400–700 m).

LAZULINE SABREWING *Campylopterus falcatus*
The species is distributed locally and uncommonly in humid forest, forest borders and shady plantations on both slopes of the East Andes, including the Perijá Mountains as the nearest population to the study area (Hilty & Brown 1986, Hilty 2002), where during an excursion to the Cerro Pintado (department of Cesar), two leks at 1,800 and 2,200 m were found in primary montane forest in June 2001 (tape-recording). New registrations for the study area come from four different sites on the northern slope of the Sierra Nevada, spanning the whole study period. Twenty-three individuals were caught, including males (Fig. 2a), females and juveniles between 450 to 1,200 m in the San Salvador Valley, at Filo Cartagena (800 m) in October 2000, at El Recuerdo (800 m) and at Vista Nieve (1,600 m) in July and October 2002. An active lek of five males was recorded at Vista Nieve within premontane forest at 1,300 m in June 2002. This lek is close to a main trail at a distance of only 1.2 km from the cabin,

where the collector M.A. Carriker lived and collected intensively in previous years (Todd & Carriker 1922). It is highly unlikely that he would have failed to encounter the lek of this species so close to his home. The recent records of the species are very interesting and raise the question, how and when did the species reach the northern slope of the Sierra Nevada massif from its original distribution on the west slope of the Perijá Mountains, where most of the species' habitats have been destroyed (pers. obs. June 2001).

SCALED PICULET *Picumnus squamulatus*

The species is known from the base of the Sierra de Perijá in Venezuela, but is not recorded from the base of the same mountains in Colombia. An isolated record exists from the south end of the Santa Marta range (Hilty 2002, Hilty & Brown 1986). Within the study period the species was observed several times in shade-coffee plantations at 1,100 m at Vista Nieve, and once at a forest border at 900 m at El Congo on the western slope. Captures were made at El Recuerdo (800 m), with an adult male on 26 September 2002 (Fig. 2b), and from Alto de Mira, with a female in January 1995 (M. Alvarez *in litt.*). The captured adult male, and also adult males seen in the field, showed yellow forecrown spots. Males of the race *roehli*, recorded from the southern slope of the Santa Marta range and north Venezuela, have red forecrown spots, sometimes yellow or orange. The race *lovejoyi* (extreme north-west Venezuela, department Zuila) is similar, but the forecrown spots of males are always yellow instead of red (del Hoyo *et al.* 2002). Following del Hoyo *et al.* (2002) the individuals from the northern slope of the Sierra Nevada Mountains are of the *lovejoyi* type, as all males showed clear yellow forecrown spots and greyer upperparts, representing the first records of this subspecies in Colombia.

RUDDY WOODCREEPER *Dendrocincla homochroa*

Only few Colombian records exist of this rare treehunter, including from both slopes of the Perijá Mountains and two records from humid forest in foothills on the east slope of the Santa Marta range in the department of Guajira (La Cueva, Los Gorros) (Hilty 2002, Hilty & Brown 1986). The species is common on the northern and north-western slope of the massif, with a total of 57 individuals caught in the San Salvador Valley (250–650 m), Alto de Mira (1,200 m) in December 1995 (Alvarez *in litt.*), El Recuerdo (800 m) and Vista Nieve at 1,600 m (Fig. 2c). This represents an altitudinal range extension from 1,250 m (Hilty 2002, Stotz *et al.* 1996), and range extension across the entire massif (85 km). The species is an indicator for premontane forest in good condition, as it was never registered in disturbed or secondary forest within the study area. Hilty (2002) noted that the species was fairly common formerly, but is declining because of forest clearance within its small Venezuelan range. Knowledge of its limited distribution is important given that it is vulnerable to premontane forest destruction in northern Colombia.

ZELEDON'S TYRANNULET *Phyllomyias zeledoni*
The species is very uncommon and locally distributed between 470 to 1,800 m in Venezuela, including the Sierra de Perijá (1,640 m), on Cerro Pejochaina. In Colombia few records exist in humid foothill forest in Meta and in west Caquetá (Hilty 2002, Hilty & Brown 1986). The first record for northern Colombia comes from El Recuerdo (800 m), where an adult was caught at a forest border on 18 October 2002 (Fig. 2d). The individual had light reddish-brown eyes, a pinkish-orange bill below, the typical greyish crown of the subspecies *wetmorei*, two narrow pale yellowish wingbars, a sharp white eyebrow, the chest flammulated yellowish olive and very characteristic spiny tarsi.

PINE WARBLER *Dendroica pinus*
The first record for Colombia and South America comes from Vista Nieve (Curson *et al.* 1994, Rodner *et al.* 2000), where a first-year female was observed intensively by the authors and S. Restrepo at 1,050 m on 20 November 2002. The individual was studied using the Sibley (2001) guide over 10 minutes in optimal light and at a distance of less than 15 m, showing a pale neck patch, dark cheeks, white spectacles, blurry streaks on the sides of the breast, white undertail-coverts and a long tail projection. The bird was feeding in the low canopy of an *Inga* tree (8 m) within a shade-coffee plantation, following a mixed-species flock, including Blackburnian Warbler *Dendroica fusca* and Tennessee Warbler *Vermivora peregrina*.

YELLOW-THROATED WARBLER *Dendroica dominica*
The species is known in South America from a sighting at Barranquilla in December 1969 and at Guiara Wash, south of Santa Marta, in October 1971 (Hilty & Brown 1986). The third record for South America is from the San Lorenzo ridge, where an adult male was observed at the border of an exotic pine plantation at 2,200 m on 20 February 2003. The species was accompanying a flock of resident species, together with Blackburnian Warbler and Tennessee Warbler. The observation was made in good light and at close distance (identification made using Sibley 2001).

CHESTNUT-SIDED WARBLER *Dendroica pensylvanica*
Three Colombian records exist for this warbler, from Tolima (October), Santander (November) and south of Cali in the Cauca Valley (November) (Hilty & Brown 1986). New records for the Caribbean region come from the San Salvador Valley, where an adult male was observed at a forest border (150 m) on 3 February 2001 and an adult female at 250 m on 17 March 2001. During an excursion to the adjacent Palomino River Valley another female was encountered in the canopy of a flowering *Anacardium* tree at 50 m on 22 February 2001. Other observations of singletons come from Tayrona National Park (eastern side) and along the Santa Marta- Ciénaga road in October 1994 (Paul Salaman *in litt.*)

FULVOUS-HEADED TANAGER *Thlypopsis fulviceps*
The species is known in Colombia from the Sierra de Perijá (to 1,900 m in June 2001, pers obs.) and from the Eastern Cordillera in Norte de Santander (Hilty & Brown 1986, Isler & Isler 1999). In Venezuela the species is uncommon at 800–1,900 m in the Sierra de Perijá (subspecies *obscuriceps*) (Hilty 2002). On 19 April 2001 two individuals were observed accompanying mixed-species flocks at 2,050 m and 2,380 m at premontane forest borders within the upper río Frío Valley, on the western slope of the Sierra Nevada massif (photo), representing a 120-km range extension.

SOOTY GRASSQUIT *Tiaris fuliginosa*
Known in Colombia from the upper Magdalena and upper río Patía valleys (Hilty & Brown 1986). In Venezuela it is recorded between 800–1,700 m in the Sierra de Perijá, where it is apparently local or seasonal in dry grassy scrub, along borders of moist and humid woodland or at grassy openings in lighter woodland (Hilty 2002). Within the study area, in total 62 individuals (males, females and juveniles) were caught at different localities, at Alto de Mira (M. Alvarez *in litt.*), within the San Salvador Valley at 250 and 450 m, El Recuerdo (800 m), Vista Nieve (1,600 m), and El Congo (850 m), representing a significant range extension and the first recording of the *zuliae* subspecies for Colombia. A nest was found at El Congo in January 2002 (photo).

Additional significant altitudinal extensions

Noteworthy altitude extensions registered during the study period are listed for 26 bird species below; the maximum or minimum elevation for each species, based on data in Fjeldså & Krabbe (1990), Hilty (2002), Hilty & Brown (1986), Renjifo *et al.* (2002), Ridgely & Greenfield (2001) and other recent publications, is followed by the new altitude extension and the locality.

SEMICOLLARED HAWK *Accipiter collaris* in Andes to 2,200 m (Ferguson-Lees & Christie 2001), from 1,800 m to 2,400 m at San Lorenzo ridge.

ZONE-TAILED HAWK *Buteo albonotatus* in Venezuela to 600 m (Hilty 2002), from 500 m to 800 m in San Salvador Valley.

BAND-TAILED GUAN *Penelope argyrotis* in Venezuela in Coastal Cordillera down to 300 m (Hilty 2002), from 900 m down to 350 m in San Salvador Valley.

BLACK-FRONTED WOOD-QUAIL *Odontophorus atrifrons* in Venezuela at 1,650–3,100 m (Hilty 2002), from 1,200 m to 700 m at El Congo.

SANTA MARTA PARAKEET *Pyrrhura viridicata* from 2,000 m (Hilty & Brown 1986) to 3,200 m at río Frío.

COPPERY EMERALD *Chlorstilbon russatus* at 500 m (del Hoyo *et al.* 1999) down to 250 m at Cerro Boliche, Santa Marta (Fig. 2e).

WHITE-TAILED STARFRONTLET *Coeligena phalerata* from 1,400 m (del Hoyo *et al.* 1999) down to 1,200 m in the San Salvador Valley.

SANTA MARTA WOODSTAR *Chaetocercus astreans* from 825 m (del Hoyo *et al.* 1999) down to 350 m in the San Salvador Valley.

YELLOW-BILLED TOUCANET *Aulacorhynchus calorhynchus* in Venezuela down to 900 m (Hilty 2002), from 600 m down to 350 m in the San Salvador Valley.

KEEL-BILLED TOUCAN *Ramphastos sulfuratus* from 1,600 m (del Hoyo *et al.* 2002) to 1,900 m at San Lorenzo.

COCOA WOODCREEPER *Xiphorhynchus susurrans* down to 1,800 m in Venezuela (Hilty 2002), from 1,100 m to 1,600 m at Vista Nieve.

STREAK-CAPPED SPINETAIL *Cranioleuca hellmayri* from 1,600 m (Stattersfield *et al.* 1998) down to 1,200 m in the San Salvador Valley.

MONTANE FOLIAGE-GLEANER *Anabacerthia striaticollis* 900–2,300 m in Venezuela (Hilty 2002), from 1,000 m down to 600 m in the San Salvador Valley.

SANTA MARTA WHITE-CROWNED TAPACULO *Scytalopus sanctaemartae* from 1,350 m (Stattersfield *et al.* 1998) down to 600 m in the San Salvador Valley.

BROWN-RUMPED TAPACULO *Scytalopus latebricola* from 2,150 m (Stotz *et al.* 1996) down to 1,900 m on the San Lorenzo ridge.

GOLDEN-BREASTED FRUITEATER *Pipreola aureopectus* down to 800 m in the Coastal Cordillera in Venezuela (Hilty 2002), from 1,300 m down to 600 m in the San Salvador Valley.

MOUNTAIN ELAENIA *Elaenia frantzii* down to 1,200 m in Venezuela (Hilty 2002), from 900 m down to 600 m in the San Salvador Valley.

BLACK-CHESTED JAY *Cyanocorax affinis* to 1,700 m in Venezuela (Hilty 2002), from 2,200 m to 2,600 m at San Lorenzo.

YELLOW-LEGGED THRUSH *Platycichla flavipes* at 100 m on Isla Margarita in Venezuela (Hilty 2002), from 600 m down to 350 m in the San Salvador Valley.

BLACK-HOODED THRUSH *Turdus olivater* 800 m in Venezuela (Hilty 2002), from 1,200 m down to 600 m in the San Salvador Valley.

BROWN-CAPPED VIREO *Vireo leucophrys* 700 m in Venezuela (Hilty 2002), from 1,200 m down to 500 m in the San Salvador Valley.

WHITE-LORED WARBLER *Basileuterus conspicillatus* from 750 m (Stattersfield *et al.* 1998) down to 450 m in the San Salvador Valley.

WHITE-SIDED FLOWERPIERCER *Diglossa albilatera* from 1,300 m (Hilty 2002) down to 1,200 m in the San Salvador Valley.

SANTA MARTA MOUNTAIN-TANAGER *Anisognathus melanogenys* from 1,500 m (Isler & Isler 1999) down to 1,200 m in the San Salvador Valley.

ROSY THRUSH-TANAGER *Rhodinocichla rosea* up to 100 m in Venezuela (Hilty 2002), from 500 m down to 100 m at Tayrona (Fig. 2f).

SLATY FINCH *Haplospiza rustica* occasionally to 1,000 m in Andes (Stotz *et al.* 1996), from 1,200 m down to 800 m at El Recuerdo.

Discussion

The Sierra Nevada de Santa Marta justifiably receives wide international recognition for its importance as an unique and highly threatened enclave for native and migrant avifauna. The massif represents the world's single-most important continental avian centre of endemism with 18 endemic species and 55 endemic subspecies, and is a highly strategic staging post for Neotropical migrant bird species travelling from the Caribbean to South America.

A total of 673 bird species, including the new records presented here, have been registered in the Sierra Nevada de Santa Marta region (Strewe unpubl.). Additions are expected from records of boreal migrants and from the invasion of non-forest species as forest destruction continues. The southern slope is partucarly poorly studied and investigations are urgently needed there, considering that more than 90% of the natural habitats have been destroyed. Security problems, as in many other localities of the region, make access to the southern slope very difficult.

The páramo region of the massif and its avifauna is practically unknown, with historical collections by Carriker (reported in Todd & Carriker 1922) and one short excursion within the río Frío valley in April 2001 (Strewe in press, b). The páramo lies entirely within the indigenous reserves and excursions require permits from the indigenous organizations. Indications are that páramo habitats and the forest–páramo ecotone are threatened through seasonal burning and grazing. Ongoing destruction of these natural habitats is threatening especially the endemics with limited ranges, low population densities and naturally localised distributions resulting from specific habitat preferences. Monitoring of the páramo habitats, their avifauna and of anthropogenic impacts on the ecosystem are of critical importance.

Within the massif less than 15 % of the original forest cover remains, and despite substantive protection status on paper, the massif continues to sustain high rates of habitat loss to human colonisation and degradation. Yet little attention or effort has been taken within the last 50 years towards conducting research to aid the implementation of effective conservation measures and adequate management strategies for this highly sensitive faunal group.

Data collected during fieldwork within the present project are being used to develop habitat management strategies, addressing identified threats to migrant and resident birds, and to implement conservation corridors and a network of private reserves. Other project objectives are to commercially produce bird-friendly coffee, and to establish an educational programme involving local communities in nature conservation and sustainable agronomy. As a result of the project activities, the río Frío, San Salvador and Toribio Valleys are declared as Important Bird Areas (IBA), under a joint BirdLife International and Alexander von Humboldt Institute (Bogotá) programme.

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A survey of the Serranía de Jungurudó, an isolated mountain range in eastern Panama

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Eastern Panama is a well-known centre of endemism for birds. In a recent analysis by BirdLife International, Stattersfield *et al.* (1998) examined the distribution of restricted-range birds (those with a total world range of less than 20,000 km^2) and defined 218 Endemic Bird Areas (EBAs), based on the co-occurrence in a given area of two or more of such species. Eastern Panama includes parts of two of these EBAs.

The Darién Highlands EBA is defined as the highlands of eastern Panama and westernmost Colombia above 700 m. Eleven restricted-range species are entirely confined to it, with another five found both there and in other EBAs. The Darién Lowlands EBA includes the lowlands and foothills of eastern Panama and westernmost Colombia up to *c.* 1,000 m. It has four species entirely confined to it, with another nine found both there and in other areas (Stattersfield *et al.* 1998).

Several of the species of this EBA are primarily found in foothills and so are restricted to the lower slopes of the same ranges where the highland endemics occur.

In addition to the species listed by Stattersfield *et al*. (1998), the restricted-range Ochraceous Wren *Troglodytes ochraceus* occurs in the Darién Highlands EBA, and Yellowish-green Tyrannulet *Phylloscartes flavovirens* and Tawny-capped Euphonia *Euphonia anneae* occur in the Darién Lowlands EBA. Stattersfield *et al*. (1998) listed Nariño Tapaculo *Scytalopus vicinior* as a species of the Darién Highlands, but it has recently been determined (Krabbe & Schulenberg 1997) that the Darién birds belong to a newly described species, Chocó Tapaculo *S. chocoensis*, which also has a restricted range.

Three main mountain ranges run in parallel lengthwise along the isthmus in easternmost Panama (Fig. 1). The range along the Caribbean coast, the Serranía de Darién, includes the highest peak in the region, Cerro Tacarcuna (1,875 m). The Serranía de Pirre (1,550 m) occupies the centre of the isthmus, with the outlying ridge of the Altos de Quía to its south-east along the Colombian border. Along the Pacific coast, the highest part of the ranges, at the headwaters of the ríos Sambú and Jaqué, is known as the Serranía de Jungurudó. The maximum elevation indicated on

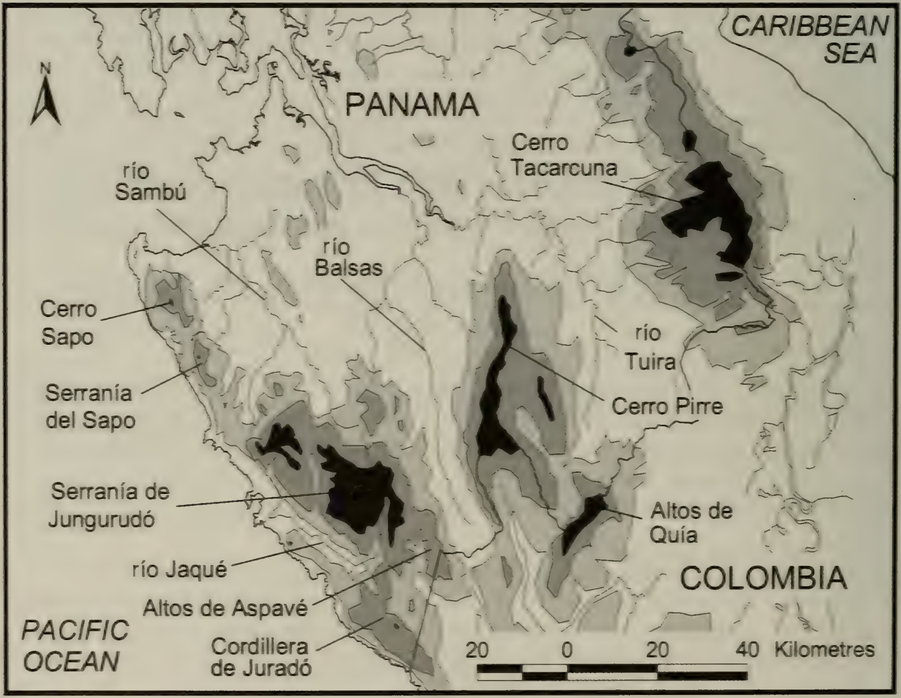
CARIBBEAN SEA
N
PANAMA
Cerro Tacarcuna
río Sambú
río Balsas
Cerro Sapo
río Tuira
Serranía del Sapo
Cerro Pirre
Serranía de Jungurudó
Altos de Quía
río Jaqué
COLOMBIA
Altos de Aspavé
PACIFIC OCEAN
Cordillera de Juradó
20
0
20
40 Kilometres

Figure 1. Mountain ranges of eastern Darién, Panama. Light grey = land above 200 m; dark grey = 500 m; black = 1,000 m.

available maps (INGTG 1993) is *c.*1,700 m. The Serranía de Sapo extends north-west from the Jungurudó and terminates at Cerro Sapo (1,145 m) near the town of Garachiné. To the south-east of the Jungurudó and connected to it are the ranges of the Cordillera de Juradó and the Altos de Aspavé. These Pacific ranges are isolated from the Serranía de Pirre, *c.*30 km to the east, by the valleys of the ríos Balsas and Juradó, which are below 200 m.

The Caribbean and central ranges of Darién have both been well studied ornithologically. Cerro Tacarcuna was surveyed by H. E. Anthony and D. S. Ball in 1915 (Anthony 1923), by C. Handley in 1959, P. Galindo in 1963, and A. Wetmore in 1964. Cerro Pirre was visited by E. A. Goldman in 1912, by R. Benson in 1928, O. Pearson in 1938, A. Wetmore in 1961, P. Galindo in 1972, and M. Robbins in 1982 (Robbins *et al.* 1985). Cana on the slopes of Cerro Pirre now has a small tourist lodge and is visited frequently by birding groups. The Altos de Quía was visited in 1970 by P. Galindo (Wetmore & Galindo 1972) and by R. Ridgely in 1975 (Ridgely & Gwynne 1989).

In contrast, the Pacific ranges have been little studied. The only site that has previously been surveyed is Cerro Sapo at the northern end of the range, by T. Barbour, W. S. Brooks and C. F. Underwood in 1922 (Barbour & Brooks 1923), and D. Feathers in 1941 (Bond & Meyer de Schauensee 1944). The Serranía de Jungurudó itself has not previously been visited by ornithologists.

Study Areas and Methods

GRA made an initial trip to the Jungurudó area between 10–15 January 1996, ascending the southern side of the range from the upper río Jaqué valley near the village of El Mamey (07°28'N, 78°00'W), and reaching 945 m on 12 January. GRA, DGC and KMA surveyed the Serranía de Jungurudó more extensively from 8–23 August 1997, ascending from its northern side. We reached the range via the río Sambú, camping at the last Embera Indian village on the river, Boca de Pavarandó, on 8 August, and on 9 August at the junction of the río Sambú and río Antaral (07°43'N, 78°01'W). We then ascended the valley of the río Antaral, camping at 195 m on 10 August, 680 m on 11 August, and 900 m on 12 August. On 13 August we established a base camp at 840 m on Cerro Antaral (07°37'N, 78°00'W). We remained at this site until 22 August, working up to an elevation of *c.*1,000 m. We were unable to reach the summit of the range due to broken terrain and dense vegetation. Cloud forest on this part of the Jungurudó range begins at *c.*900 m. Although the best available map of the area (IGNTG 1993), originally prepared by the Raytheon Corporation from radar data obtained in 1967, indicates that the range reaches an elevation of 1,700 m, our altimeter readings suggested that its maximum elevation actually may be only about 1,200 m.

In addition to walking trails and streams in the area, on 17–19 August we carried out *c.*130 hours of mist-netting near the base camp, using 6–8 nets, 12 m long with a 36-mm mesh. We tape-recorded vocalizations using Sony TCM-5000 portable tape-recorders with Sennheiser short shotgun microphones, and collected specimens by shotgun and by mist-netting.

Results

We report here observations of species of limited distribution or rare in Panama, especially restricted-range species. Endemic species of the Darién Lowlands EBA are indicated by an asterisk, and those of the Darién Highlands EBA with a double asterisk. Additional species occurring above 700 m are listed in the appendix. Selected recordings have been deposited with the Library of Natural Sounds (LNS), Cornell University, Ithaca, New York, USA, and specimens have been deposited at the Museo de Vertebrados of the Universidad de Panama, Panama City, Panama (MVUP) and at the American Museum of Natural History (AMNH), New York, USA.

***CHOCÓ TINAMOU** *Crypturellus kerriae*
Occasional at lower elevations. One was tape-recorded at our camp at the mouth of the río Antaral on 9 August 1997, and heard there again on 22 August. The call was also heard at our camp at 680 m on 11 August. The species is otherwise known in Panama from two specimens taken on the Altos de Quía in 1970 (Wetmore & Galindo 1972, Wetmore *et al.* 1984), and from sight records and calls heard above Cana on Cerro Pirre (various observers). On 21 February 1995 P. Phillips (pers. comm.) obtained the wing of one (MVUP 2206) from Embera Indian hunters in the upper valley of the río Jaqué (07°29'N, 77°57'W). The species is considered threatened (Vulnerable) at the global level (BirdLife International 2000).

BLACK-AND-WHITE HAWK EAGLE *Spizastur melanoleucus*
One was seen soaring high over the Jungurudó ridgetop on 20 August 1997. The species is rare in Panama and throughout its range. The only previous records from Darién have been from Cana on Cerro Pirre and from the valley of the río Tuira (Ridgely & Gwynne 1989).

PLUMBEOUS PIGEON *Patagioenas plumbea*
Very common in both lowlands and highlands, and heard calling almost every day. Two birds were tape-recorded (LNS 96086 and 96087) and then collected by shotgun near the base camp on 14 August 1997 (AMNH 834071 and MVUP 2204 respectively). These represent the first specimens from Middle America. Both specimens had pale cream-coloured eyes and grey wing-linings, characteristic of *Patagioenas plumbea* (Gibbs *et al.* 2001). The very similar Short-billed *P. nigrirostris* and Ruddy Pigeons *P. subvinacea* also occur in Darién. However, both have red or reddish eyes. *P. nigrirostris* has dark greyish-brown wing linings, and in *P. subvinacea* they are cinnamon (Gibbs *et al.* 2001).

These birds gave a distinctive three-note call (*whit-mo-go*), sometimes with the third note slurred (*whit-mo-go'o*). The tape-recordings were compared with samples from South America obtained from the Library of Natural Sounds. They matched closely LNS 72408 from Esmeraldas, Ecuador; LNS 84089 from Pichincha, Ecuador; and LNS 80905 from Cundinamarca, Colombia. However, they differed from LNS 80834 from Cundinamarca, a distinctly four-noted call. According to Gibbs *et al.* (2001), calls of *P. plumbea* are geographically variable. The closest subspecies for which Gibbs *et al.* (2001) described the call, *delicata* of western and central Amazonia, has a three-note call. Gibbs *et al.* (2001) did not provide a description of the call of *chapmani* of western Colombia and Ecuador. The calls of *P. nigrirostris* and *P. subvinacea* are both typically four-noted (Gibbs *et al.* 2001). GRA also heard the call of this species near the headwaters of the río Jaqué, on the southern flanks of the Serranía de Jungurudó, on 15 January 1996.

TABLE 1

Distribution of restricted-range species of the Darién Highlands Endemic Bird Area, and of foothills species of the Darién Lowlands Endemic Bird Area, in the mountains of eastern Darién. 'Pacific' includes the Serranía de Jungurudó and Cerro Sapo. 'Central' includes the Serranía de Pirre and the Altos de Quía. 'Caribbean' includes Cerro Tacarcuna. Range extensions from this study are indicated with an asterisk. Note: Blue-and-gold Tanager *Bangsia arcaei* occurs only in the western part of the Endemic Bird Area.

Species		**Pacific**	**Central**	**Caribbean**
Darién Highlands				
Tacarcuna Wood-quail	*Odontophorus dialeucos*			x
Russet-crowned Quail-dove	*Geotrygon goldmani*	x	x	x
Bare-shanked Screech-owl	*Otus clarkii*		x	x
Violet-capped Hummingbird	*Goldmania violiceps*			x
Rufous-cheeked Hummingbird	*Goethalsia bella*	x	x	
Beautiful Treerunner	*Margarornis bellulus*	x*	x	x
Tacarcuna Tapaculo	*Scytalopus panamensis*			x
Chocó Tapaculo	*Scytalopus chocoensis*	x*	x	
Ochraceous Wren	*Troglodytes ochraceus*		x	x
Varied Solitaire	*Myadestes coloratus*	x*	x	x
Sooty-faced Finch	*Lysurus crassirostris*			x
Tacarcuna Bush-tanager	*Chlorospingus tacarcunae*			x
Pirre Bush-tanager	*Chlorospingus inornatus*	x	x	
Yellow-collared Chlorophonia	*Chlorophonia flavirostris*		x	
Green-naped Tanager	*Tangara fucosa*	x*	x	x
Pirre Warbler	*Basileuterus ignotus*		x	x
Darién Lowlands (foothills species)				
Chocó Tinamou	*Crypturellus kerriae*	x*	x	
Purplish-backed Quail-dove	*Geotrygon lawrencii*			x
Stripe-cheeked Woodpecker	*Piculus callopterus*	x	x	
Spiny-cheeked Antshrike	*Xenornis setifrons*			x
Black-crowned Antpitta	*Pittasoma michleri*	x	x	x
Tawny-capped Euphonia	*Euphonia anneae*			x
Black-and-yellow Tanager	*Chrysothlypis chrysomelas*	x	x	x

The species also occurs on the Serranía de Pirre, where it has apparently been overlooked until recently due to its close similarity to *P. nigrirostris* and *P. subvinacea*. On 2 May 1994 GRA heard several birds calling near the north end of the Pirre range above the town of El Real. On 11 April 1995 GRA, D. & L. Engleman and others observed a bird with cream-coloured eyes calling on the trail above Cana on Cerro Pirre, and several others were heard. On 30 March 2001, GRA saw and tape-recorded a bird with cream-coloured eyes giving a three-note call on the same trail. P. Coopmans (pers. comm.) heard the species commonly in the 600–1,300 m range at Cana between 30 January–9 February 1992, and tape-recorded it on 2 and 6 February (LNS 60300, 60302, 60333, 60336; catalogued as '*Columba* species'). Coopmans heard the species subsequently at Cana on trips in December 1994–January 1995, February 1996 and March 1998. G. Rompré (pers. comm.) saw a bird with pale eyes and heard it calling at 550 m near the north end of the Pirre range on 21 April 1995.

We found Short-billed Pigeon to be rare on the Jungurudó, with one heard calling at 300 m on 11 August 1997, and greatly outnumbered by *P. plumbea*. We did not see or hear Ruddy Pigeon.

****RUSSET-CROWNED QUAIL-DOVE** *Geotrygon goldmani*
Common in the highlands near our base camp, recorded almost every day, mostly by voice. This restricted-range species is endemic to the highlands of Darién and eastern Panamá province. It is otherwise known from Cerro Jefe and Cerro Brewster and the Serranía de Majé in eastern Panama province, and in Darién from Cerro Tacarcuna, Cerro Pirre, and Cerro Sapo (Wetmore 1968, Ridgely & Gwynne 1989). The species is considered Near Threatened at the global level (BirdLife International 2000).

CENTRAL AMERICAN PYGMY-OWL *Glaucidium griseiceps*
GRA heard one at the village of El Mamey on the upper río Jaqué on 9 and 15 January 1996, and one was seen and heard at our camp in the lowlands on the río Antaral on 9 and 10 August 1997. This rare to uncommon species is elsewhere known from Darién from the lower Chucunaque River, and from Cana and the lower slopes of Cerro Pirre (Wetmore 1968, Ridgely & Gwynne 1989).

TOOTH-BILLED HUMMINGBIRD *Androdon aequatorialis*
Occasional in the highlands, recorded on 13, 17 and 21 August 1997. One female was collected on 17 August (MVUP 2026). Previously recorded in Panama from Cerro Tacarcuna, Cerro Pirre and Cerro Sapo (Wetmore 1968).

GREEN THORNTAIL *Discosura conversii*
A male was seen by GRA at *c.*750 m on a ridge above the río Jaqué on 13 January 1996. The species is otherwise known from Darién from near Cana on Cerro Pirre (Wetmore 1968, Ridgely & Gwynne 1989).

****RUFOUS-CHEEKED HUMMINGBIRD** *Goethalsia bella*
Very common in the highlands, recorded every day. A male and a female were collected on 17 August 1997 (MVUP 2209, 2210). One was seen also by GRA on 12 January 1996 at 900 m, above the headwaters of the río Jaqué. This species is endemic to the highlands eastern Darién, being otherwise known from Cerro Pirre and Cerro Sapo (Wetmore 1968, Ridgely & Gwynne 1989). This species is considered Near Threatened at the global level (BirdLife International 2000).

GREENISH PUFFLEG *Haplophaedia aureliae*
Common in the highlands, recorded almost every day. One male was collected on 18 August 1997 (MVUP 2211). Known otherwise in Panama only from Cerro Tacarcuna and Cerro Pirre (Wetmore 1968, Ridgely & Gwynne 1989).

***STRIPE-CHEEKED WOODPECKER** *Piculus callopterus*
Rare in the foothills, recorded on 12 August and on 22 August 1997 at 650 m. Previously recorded from Veraguas; eastern Colón Province; Cerro Azul, Cerro Jefe and Cerro Chucantí in Panamá province; and in Darién from the upper Jaqué Valley and Cerro Pirre (Wetmore 1968, Ridgely & Gwynne 1989).

****BEAUTIFUL TREERUNNER** *Margarornis bellulus*
Uncommon in the highlands, with individuals seen on 15, 19, and 20 August 1997. A female was collected 15 August and a male on 19 August (MVUP 1975, 1976). This Darién Highlands endemic is otherwise known from Cerro Tacarcuna and Cerro Pirre (Wetmore 1972), Altos de Quía (Ridgely & Gwynne 1989) and the Serranía de Majé (Angehr & Christian 2000). The species is considered Near Threatened at the global level (BirdLife International 2000).

SHARP-TAILED STREAMCREEPER *Lochmias nematura*
Rare in the highlands. One was seen in a steep ravine on 15 August 1997 (DGC). Otherwise known in Panama from Cerro Malí (near Cerro Tacarcuna), Cerro Pirre and the Altos de Quía (Wetmore 1972, Ridgely & Gwynne 1989).

***BLACK-CROWNED ANTPITTA** *Pittasoma michleri*
This restricted-range species was rare in the highlands, recorded on 12 and 13 August 1997. It is rare but widespread in the Darién lowlands and foothills (Wetmore 1972, Ridgely & Gwynne 1989).

****CHOCÓ TAPACULO** *Scytalopus chocoensis*
Common in wet ravines in the highlands. A pair was tending a nest with two nestlings within 40 m of our base camp, and these were collected on 19 August 1997 (tape-recorded as LNS 09089 and 09090; AMNH 834072 and 834073). Christian (2001) described the nest and nesting behaviour. In addition, two other adult males were collected, on 16 and 17 August (MVUP 2207, 2208), and a juvenile on 15 August

1997 (LNS 09088, AMNH 834074). Two forms of *Scytalopus* are known from eastern Darién. Two specimens (a male and a female) collected on Cerro Pirre by O. Pearson in 1938 were originally assigned to Nariño Tapaculo *S. vicinior* (Wetmore 1972). In a recent revision, Krabbe & Schulenberg (1997) included the Cerro Pirre birds in a newly described taxon, *S. chocoensis,* whose range extends along the western flank of the Andes in Colombia and Ecuador. *S. chocoensis* males lack facial patterning (Krabbe & Schulenberg 1997). The Pale-throated, or Tacarcuna, Tapaculo *S. panamensis* is endemic to Cerro Tacarcuna. Males have a broad silvery superciliary stripe beginning above and extending behind the eye. The breeding male from the Jungurudó has a faint but definite light grey superciliary stripe and a faint greyish crescent on the cheek. The superciliary stripe is much less distinct than that of *S. panamensis.* The other two male specimens lack any facial patterning. Other males seen on the Jungurudó had traces of a facial pattern. Some male *Scytalopus* on Cerro Pirre also have a trace of a facial pattern (GRA pers. obs.). Calls of the Jungurudó birds closely resemble recordings of *S. chocoensis* provided by N. Krabbe.

BRONZE-OLIVE PYGMY-TYRANT *Pseudotriccus pelzelni*
Rare in the highlands. A pair was observed in cloud forest at *c.* 1,000 m on 20 and 21 August 1997 (DGC). The species is otherwise known in Panama only from Cerro Tacarcuna and Cerro Pirre (Wetmore 1972, Ridgely & Gwynne 1989).

GREEN MANAKIN *Chloropipo holochlora*
Very common in the highlands. In Panama the species occurs from Cerro Brewster in eastern San Blas eastwards, and is rare to uncommon (Ridgely & Gwynne 1989). A nest found on 15 August 1997 was described by Christian (2001).

WHITE-WINGED SWALLOW *Tachycineta albiventer*
A group of seven was seen on the río Sambú (DGC and KMA) during our descent of the river on 25 August 1997. This represents the second report of this species from Panama, the first being by Seutin (1998) on the río Balsas.

SOOTY-HEADED WREN *Thryothorus spadix*
Uncommon in the highlands. Otherwise known in Panama from Cerro Tacarcuna, Cerro Pirre and the Altos de Quía (Wetmore *et al.* 1984, Ridgely & Gwynne 1989).

****VARIED SOLITAIRE** *Myadestes coloratus*
Very common in the highlands. Two males were collected on 17 and 18 August 1997 (MVUP 1979, 1982). This species is endemic to the eastern Darién highlands, otherwise being found on Cerro Tacarcuna and Cerro Pirre (Wetmore *et al.* 1984 , Ridgely & Gwynne 1989), and recently discovered on the Serranía de Majé (Angehr & Christian 2000).

GREY-AND-GOLD TANAGER *Tangara palmeri*
Uncommon in the highlands. Otherwise known in Panama from Cerro Tacarcuna, Altos de Quía, Cerro Pirre and Cerro Sapo (Wetmore *et al.* 1984, Ridgely & Gwynne 1989), with recent sightings from Nusagandi in eastern San Blas province (D. Engleman, pers. comm.) and from Cerro Azul in eastern Panama province (W. Adsett & G. Seutin, pers. comm.).

****GREEN-NAPED TANAGER** *Tangara fucosa*
Uncommon in the highlands. A female was collected on 21 August 1997 (MVUP 2212). The nest and nesting behaviour of a pair found on 20 August were described by Christian (2001). The species is endemic to the eastern Darién Highlands, and is otherwise known only from Cerro Malí near Cerro Tacarcuna and Cerro Pirre (Wetmore *et al.* 1984). The species is considered Near Threatened at the global level (BirdLife International 2000).

ORANGE-BELLIED EUPHONIA *Euphonia xanthogaster*
Common in the highlands. Otherwise known in Panama from Cerro Pirre, Altos de Quía, Cerro Sapo and the río Jaqué valley (Wetmore *et al.* 1984, Ridgely & Gwynne 1989).

SCARLET-BROWED TANAGER *Heterospingus xanthopygius*
Rare, one seen at *c.*700 m on 11 August 1997 (DGC). Known in Panama from the Tuira River valley, Cerro Pirre, Cerro Sapo and the Jaqué River valley (Wetmore *et al.* 1984, Ridgely & Gwynne 1989).

****PIRRE BUSH-TANAGER** *Chlorospingus inornatus*
Very common in the highlands. Endemic to the eastern Darién highlands, and previously recorded only on Cerro Pirre and Cerro Sapo (Wetmore *et al.* 1984, Ridgely & Gwynne 1989). One male was collected on 20 August 1997 (MVUP 1974).

***BLACK-AND-YELLOW TANAGER** *Chrysothlypis chrysomelas*
This restricted-range species was fairly common in the highlands. It is otherwise fairly widely distributed in both western and eastern Panama, and known in Darién from Cerro Tacarcuna, Cerro Pirre, Cerro Sapo and Cerro Quía (Wetmore *et al.* 1984, Ridgely & Gwynne 1989).

STRIPE-HEADED BRUSH-FINCH *Buarremon torquatus*
Two were seen by GRA at 750 m near the headwaters of the río Jaqué on 12 January 1996. This rare to uncommon species is otherwise known from Darién from Cerros Pirre and Tacarcuna (Wetmore *et al.* 1984, Ridgely & Gwynne 1989).

YELLOW-GREEN GROSBEAK *Caryothraustes canadensis*
A small flock was seen at 640 m on 22 August 1997. Otherwise known in Panama only from Cerro Pirre (Wetmore *et al.* 1984, Ridgely & Gwynne 1989).

Conclusions

The avifauna of the Serranía de Jungurudó is most similar to that of the nearby Serranía de Pirre, but also shares species with the more distant Cerro Tacarcuna. Of the 11 restricted-range species of the Darién Highlands Endemic Bird Area known to occur on Pirre, we found seven on the Jungurudó (Table 1). Four of these also occur on Cerro Tacarcuna. Except for Russet-crowned Quail-dove, Rufous-cheeked Hummingbird and Pirre Bush-tanager, previously known from Cerro Sapo, these represent the first records from the Pacific ranges of Darién. The species occurring on Pirre that we did not encounter were Bare-shanked Screech-owl *Otus clarki*, Ochraceous Wren *Troglodytes ochraceus*, Pirre Warbler *Basileuterus ignotus* and Yellow-collared Chlorophonia *Chlorophonia flavirostris*. All of these, except the wren, usually occur at higher elevations than we were able to reach on the Jungurudó; the lower elevational limits for these species listed by Ridgely & Gwynne (1989) are 1,080, 750, 1,350 and 1,200 m respectively. Of the seven species of the Darién Lowlands Endemic Bird area that are found primarily in foothills, we found four on the Jungurudó (Table 1); two of these also occur on Cerro Tacarcuna. Of these, the records of Chocó Tinamou are the first for the Pacific ranges.

Many of the new records included here represent a significant expansion in the known ranges of several species that occupy very limited geographical areas. Fortunately, there are grounds for optimism for the conservation of the restricted-range species of the Darién mountains. Most of the highlands, including the Jungurudó, have been legally protected within Darién National Park (579,000 ha), with the exception of the Pacific ranges north of Cerro Sapo. Although clearing for subsistence agriculture and logging are having a severe impact on the lowland forests of Darién, at present the highland areas are still mostly untouched.

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Appendix. Additional species observed above 700 m on the Serranía de Jungurudó.

Great Tinamou *Tinamus major*, common; Little Tinamou *Crypturellus soui*, rare; Tiny Hawk *Accipiter superciliosus*, rare; White Hawk *Leucopternis albicollis*, occasional; Barred Hawk *Leucopternis princeps*, rare; Black Hawk-eagle *Spizaetus tyrannus*, occasional; Ornate Hawk-eagle *Spizaetus ornatus*, occasional; Barred Forest-falcon *Micrastur ruficollis*, not uncommon; Collared Forest-falcon *Micrastur semitorquatus*, rare; Crested Guan *Penelope purpurascens*, uncommon; Black-eared Wood-quail *Odontophorus melanoleucus*, occasional; Tawny-faced Quail *Rhynchortyx cinctus*, occasional; Ruddy Quail-dove *Geotrygon montana*, fairly common; Vermiculated Screech-owl *Otus guatemalae*, rare; Green Hermit *Phaethornis guy*, very common; Green-crowned Brilliant *Heliodoxa jacula*, common; Collared

Trogon *Trogon collaris*, fairly common; Rufous Motmot *Baryphthengus martii*, rare; Red-headed Barbet *Eubucco bourcierii*, rare; Emerald Toucanet *Aulacorhynchus prasinus*, common; Yellow-eared Toucanet *Selenidera spectabilis*, common; Keel-billed Toucan *Ramphastos sulfuratus*, rare; Cinnamon Woodpecker *Celeus loricatus*, rare; Spotted Barbtail *Premnoplex brunnescens*, fairly common; Slaty-winged Foliage-gleaner *Philydor fuscipennis*, uncommon; Ruddy Foliage-gleaner *Automolus rubiginosus*, uncommon; Plain Xenops *Xenops minutus*, rare; Tawny-throated Leaftosser *Sclerurus mexicanus*, rare; Wedge-billed Woodcreeper *Glyphorynchus spirurus*, rare; Spotted Woodcreeper *Xiphorhynchus erythropygius*, very common; Western Slaty Antshrike *Thamnophilus atrinucha*, uncommon; Russet Antshrike *Thamnistes anabatinus*, uncommon; Plain Antvireo *Dysithamnus mentalis*, uncommon; Checker-throated Antwren *Myrmotherula fulviventris*, rare; Slaty Antwren *Myrmotherula schisticolor*, uncommon; Immaculate Antbird *Myrmeciza immaculata*, uncommon; Bicoloured Antbird *Gymnopithys leucapsis*, rare; Ocellated Antbird *Phaenostictus mcleannani*, rare; Spectacled Antpitta *Hylopezus perspicillatus*, rare; Paltry Tyrannulet *Zimmerius vilissimus*, rare; Olive-striped Flycatcher *Mionectes olivaceus*, very common; Scale-crested Pygmy-tyrant *Lophotriccus pileatus*, very common; White-throated Spadebill *Platyrinchus mystaceus*, common; Ruddy-tailed Flycatcher *Terenotriccus erythrurus*, uncommon; Sulphur-rumped Flycatcher *Myiobius barbatus*, uncommon; Tufted Flycatcher *Mitrephanes phaeocercus*, uncommon; Dusky-capped Flycatcher *Myiarchus tuberculifer*, rare; Thrush-like Schiffornis *Schiffornis turdinus*, common; White-ruffed Manakin *Corapipo altera*, very common; Grey-breasted Wood-wren *Henicorhina leucophrys*, very common; Tawny-faced Gnatwren *Microbates cinereiventris*, common; Slaty-backed Nightingale-thrush *Catharus fuscater*, very common; Pale-vented Thrush *Turdus obsoletus*, uncommon; Slate-throated Redstart *Myioborus miniatus*, common; Buff-rumped Warbler *Basileuterus fulvicauda*, rare; Bananaquit *Coereba flaveola*, common; Emerald Tanager *Tangara florida*, common; Silver-throated Tanager *Tangara icterocephala*, very common; Speckled Tanager *Tangara guttata*, occasional; Bay-headed Tanager *Tangara gyrola*, fairly common; Lemon-spectacled Tanager *Chlorothraupis olivacea*, very common; Hepatic Tanager *Piranga rubra*, rare; Dusky-faced Tanager *Mitrospingus cassinii*, occasional; Slate-coloured Grosbeak *Saltator grossus*, fairly common; Chestnut-capped Brush-finch *Buarremon brunneinucha*, common; Scarlet-rumped Cacique *Cacicus uropygialis*, common.

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The downy young of grey teal (Anatidae) with first descriptions of the ducklings of Madagascar Teal *Anas bernieri* and Indonesian Teal *A. gibberifrons*

by H. Glyn Young & Mark Brayshaw

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The grey teal are a group of small (*c*.300–700g) *Anas* dabbling ducks from Madagascar, Asia and Australasia. Grey teal are predominantly tree cavity nesters and, in many places, restricted to mangrove forest and associated wetlands. Modern species in this group are often highly dispersive and it is probable that their ancestors spread along coasts and visited islands throughout the Indian Ocean during the

Pleistocene, when sea levels were much lower than today (Young 2002). Teal may have island-hopped westwards to Madagascar when land, now submerged, held mangrove and, possibly, populations of grey teal.

The number of grey teal taxa recognised as full species has, in recent years, ranged from two (Ripley 1942) to five (Livezey 1997, Kear in press). The grey teal were often further grouped with three species of brown teal from New Zealand (see e.g. Delacour & Mayr 1945) to form the austral teal; however, the close link with these species is no longer considered valid (Young *et al.* 1997, Daugherty *et al.* 1999, Kennedy & Spencer 2000). In this paper we follow Livezey (1997) and recognise five species: Madagascar or Bernier's Teal *Anas bernieri* from western Madagascar, Andaman Teal *A. albogularis* from the Andaman Islands (India), Indonesian or Sunda Teal *A. gibberifrons* from Sumatra to Sulawesi (Indonesia), Grey Teal *A. gracilis* from eastern Indonesia, Australia, New Caledonia and New Zealand (including the recently extinct *A. gracilis remissa* of Rennell Island; see Ripley 1942, Young *et al.* 1996) and Chestnut Teal *A. castanea* from Australia. The recently extinct (*c.*1710; BirdLife International 2000) Sauzier's Teal *A. theodori* of the Mascarene Islands may also have been a grey teal (Mourer-Chauviré *et al.* 1999).

Grey and Chestnut Teal are common and well studied (see e.g. Marchant & Higgins 1990). The remaining species, however, are much less well known and many areas of their biology are as yet undescribed. The range of the Indonesian Teal and extent of any overlap with that of the Grey Teal are uncertain. The development of a captive population of the Endangered Madagascar Teal at Jersey Zoo (Durrell Wildlife Conservation Trust) has allowed a close study of this species that is not practical in the wild: the nest and eggs were first described in 2001 (Young *et al.* 2001). Andaman and Indonesian Teal have also been poorly studied in the wild and have often been overlooked by ornithologists who accepted the view that, although dissimilar, they were conspecific with Grey Teal (Young 1996) as *A. gibberifrons*. The downy young of Madagascar Teal have never been described, and those of Indonesian Teal not adequately. Livezey (1991), in his study of dabbling duck morphology, included data on the downy young of Grey (as *A. gibberifrons*), Chestnut and Andaman Teal; however, he did not include Indonesian Teal as a separate species and no material of *A. bernieri* was available to him.

At Jersey Zoo, 130 Madagascar Teal (1998–2002) and 11 Indonesian Teal (1998–2001) have been hatched from nine and an unknown number of wild founders respectively. Several downy young of both species were drawn and photographed at three to five days old when the plumage was bright (Class IA; Gollop & Marshall 1954). These two species are described below and depicted in Fig. 1 with descriptions of Grey, Chestnut and Andaman Teal based on published material (see references below) and one museum specimen of Andaman Teal. Nomenclature follows Livezey (1991) and Nelson (1993).

Species accounts

GREY TEAL *Anas gracilis*

Sources Downy young were described by Delacour (1956; includes colour plate), Cunningham & Welch (1955; includes black and white plate), Frith (1982; includes black and white plate) and Marchant & Higgins (1990; includes colour plate). Description by Phillips (1923) presumably referred to *A. gibberifrons* (see below).

Plumage Dull grey-brown above and off-white below. Crown, nape, back, wings and sides to just below wings, dark brown. Underparts, mostly dull white, washed cream. At junction of foreneck and breast, the down is duller. Thighs, dark brown. Face light buff with pinkish tinge at the rear. Chin white but face showing warmer brown tones. Faint dark brown eyestripe extends from bill, through eye to ear-coverts. Narrow light-brown supra-orbital stripe, becomes light brown distally. Throat and foreneck, dull white. From back to tail, the down is hair-like and pale dark brown. Two pale whitish spots on back; shoulder spot is smaller than rump spot. Tail is dark brown; open pennaceous and hair-like. Posterior margin of upperwing ('primaries' and 'secondaries' (Nelson 1993) i.e. the wing areas where these wing feathers will later emerge) is white, the rest, dark brown. Radius–ulna region of underwing is dark brown; the posterior margin is a narrow white band, the remainder, white, tipped brown.

Bare parts Bill is dark slaty black or blue-grey, brown tipped and horn-coloured in the middle, the underside is pinkish. Legs are slate-grey, the webs brownish.

Iris Dark grey-brown.

CHESTNUT TEAL *Anas castanea*

Sources Downy young were described by Phillips (1923), Delacour (1956; includes colour plate), Frith (1982; includes black and white plate) and Marchant & Higgins (1990; includes colour plate).

Plumage Similar to Grey Teal, but darker; whitish areas are replaced by yellow and grey plumage is heavily suffused with chestnut. Grey-brown above, underparts paler with pale yellow wash; there are two conspicuous brown stripes on head. Crown, hindneck and eyestripe are dark brown with a dark cheek stripe extending to ear-coverts. Rest of sides of head, including supra-orbital stripe are light rufous-brown. Foreneck dull white. Shoulder and rump spots are both small and pale. Tail is dark brown. Upperwing is dark brown; the trailing edge ('primaries' and 'secondaries' see above) are dull white. The underwing is dull brown. Undertail-coverts and vent are dark brown.

Bare parts No published details; however, considered similar to Grey Teal (Fullagar pers. comm.).

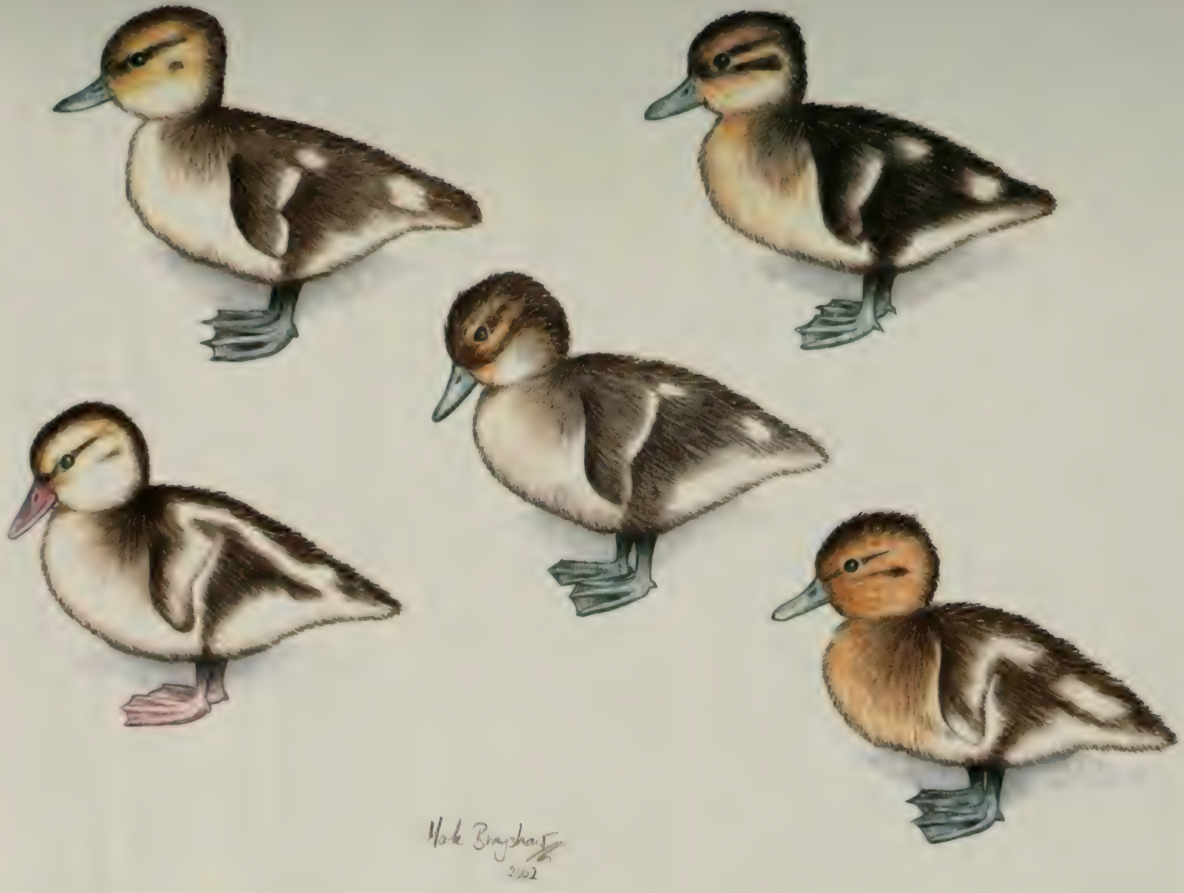

Figure 1. The downy young of grey teal: (top left) Grey Teal *Anas gracilis*; (top right) Chestnut Teal *A. castanea*; (centre) Andaman Teal *A. albogularis*; (lower left) Madagascar Teal *A. bernieri*; (lower right) Indonesian Teal *A. gibberifrons*. Mark Brayshaw.

Iris No published details; however, considered similar to Grey Teal (Fullagar pers. comm.).

ANDAMAN TEAL *Anas albogularis*

Sources Brief descriptions were given by Phillips (1923) and Delacour (1956; includes colour plate). Unpublished black-and-white drawings of one museum specimen (BMNH 1927.2.1.2) were made by Julian Hume and used in preparation of Fig. 1.

Plumage Similar to Grey Teal, grey-brown above with duller underparts. Facial patterns may vary (as they do in adults, see Grimmett *et al.* 1998). Eyestripe and cheek-stripe may be dark with a buffy supra-orbital stripe and cheeks. However, eyestripe and supra-orbital stripes may be lacking altogether, and, occasionally, face may be entirely dark brown with one small line or two elongated white spots above the eye and another one below. Shoulder and rump spots are small and pale, trailing edge to upperwing ('primaries' and 'secondaries' see above) is whitish.

Bare parts No published details. Peter Scott (Delacour 1956, Plate XI) painted the bill dark grey or slaty-black.

Iris No published details. Peter Scott (Delacour 1956, Plate XI) painted the iris dark.

INDONESIAN TEAL *Anas gibberifrons*

Sources No published details. However, brief description of Grey Teal *A. gibberifrons* by Phillips (1923) was of a specimen collected in the Celebes (now Sulawesi, Indonesia) and thus presumably Indonesian Teal. Living ducklings at Jersey Zoo (1998–2001).

Plumage Brown upperparts, white below. Cap almost black, the eyestripe is dark and narrow, not joining the nape. Cheek-stripe is narrow, darker and broader towards ear and does not join nape. The supra-orbital and suborbital stripes are broad and brown. The cheeks, chin and breast to legs are brown, the vent and large shoulder and rump spots are pale. Upperparts and wings are dark grey, the trailing edge of the upperwing are off-white.

Bare parts Bill, legs and webs dark grey.

Iris Dark grey-brown.

MADAGASCAR TEAL *Anas bernieri*

Source Living ducklings at Jersey Zoo (1998–2002).

Plumage Grey above and off-white below, almost like a grey-and-white young of shelduck *Tadorna* sp. Grey cap and nape. Face appears pale: eyestripe is narrow and does not reach the nape. The cheek-stripe is reduced and appears as a small ear spot with a little of the stripe remaining below the eye at the base of the bill. The supraorbital stripe is large and yellowish white, contrasting a little with the cheek and suborbital stripe. Back is grey with white shoulder and rump spots joining to form a white band from the vent area to the scapular region leaving a large 'island' of grey from the thigh to the flanks. Trailing edge of the wing is white, forming a pale band that may take up half of the wing and joins at the shoulder with the shoulder–rump band.

Bare parts Bill is pinkish grey with pink edges and pink underside. Bill of some individuals may be entirely pink. Legs pinkish grey, webbing pink with greyer centres

Iris Dark, centre brown.

Discussion

The morphology of grey teal ducklings further emphasises the distinct nature of Madagascar Teal within this otherwise homogenous group of dabbling ducks. The young of Grey and Chestnut are differently coloured, as are the adults, even though these species are considered to be similar in reproductive behaviour (Prawiradilaga 1985) and in their genetic makeup (Sraml *et al.* 1996, Young *et al.* 1997). The variable plumage of adult Andaman Teal is mirrored in the patterning of its downy young.

The young of Grey and Indonesian Teal are quite distinct from one another; the brown faces of young Indonesian Teal contrast with the grey coloration of the Grey Teal. Whilst the difference between these ducklings may be of little additional taxonomic importance, it is a further tool in the identification of breeding birds in eastern Indonesia and the subsequent mapping of the ranges of the two species. Madagascar Teal (Endangered; BirdLife International 2000) and Andaman Teal (Endangered; TWSG 2001) are already threatened with extinction. The loss of suitable habitat throughout Indonesia will only increase the chances of Indonesian Teal also becoming extinct, a risk that is not reduced by the dearth of information on their distribution and habitat requirements.

Acknowledgements

We thank The Durrell Wildlife Conservation Trust for allowing us access to the captive populations of Madagascar and Indonesian Teal. Janet Kear was encouraging and supportive throughout all parts of the research into *Anas bernieri* and made valuable comments on this study of ducklings. Julian Hume and Peter Fullagar read the manuscript and provided personal observations and drawings of *A. albogularis* and photographs of *A. gracilis* and *A. castanea* respectively. Murray Williams kindly read through the paper and made helpful suggestions.

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Sighting of Van Dam's Vanga *Xenopirostris damii* (Schlegel, 1866) in mangroves in north-west Madagascar

by Lance Woolaver, Rina Nichols, Félix Razafindrajao & Frank Hawkins

Received 27 April 2003

Van Dam's Vanga *Xenopirostris damii* (Schlegel, 1866) is known from only three locations in Madagascar, where it is endemic (Fig. 1). It is currently classified as Endangered (BirdLife International 2000). The type specimens were collected in 1864 from the Ambazoana River valley (Schlegel 1866), not as usually reported on the Ampasindava Peninsula, but *c.*50 km further north near Ambaro Bay (Dee 1986). This species has not been recorded in this area since, although there has been little survey effort. Subsequent sightings have been from western Madagascar, where the bird was discovered in 1928 in the old-growth dry deciduous forest of Ankarafantsika, *c.*450 km to the south-west of the type locality (Lavauden 1932). This site includes the Ampijoroa Forest Station where the species is regularly seen. Van Dam's Vanga has also been recorded in the dry deciduous forest of Analamera in the far north of Madagascar (Hawkins *et al.* 1990).

This note describes the sighting of a single male in a mangrove forest south of the village of Ankazomborona, near the Ampasindava peninsula, *c.*30 km north-east of the type locality at Ambazoana.

Surveys were carried out in the mangrove *Avicennia marina* forest to the south of the village of Ankazomborona. They took place over five days (116 person hours), between 11 and 24 March 2001, and between 0800 h and 1330 h. Approximately 6 km^2 (2 x 3 km) was surveyed each day, on foot, such that 30 km^2 (10 x 3 km) in total was covered by a team of four people.

The bird was seen on 21 March at 1010 h (13°23'S, 48°47'E), *c.*1.5 km inland from the coast and 30 km north-east of the locality (13°35'S, 48°40'E) where the type specimens were collected in 1864 (Dee 1986).

The vanga was perched on a branch, 2 m above the ground in a mangrove tree. It was gaping slightly and was silent. It was observed for three minutes with binoculars (8 x 42 magnification) from a distance of < 5 m.

The thickness and darkness of the bill were the most immediately striking features. Both the upper and lower mandibles were uniformly dark grey, almost black. The slight terminal hook of the upper mandible was clearly visible. The forehead, crown and ear-coverts were very dark, appearing uniformly black. The mantle, scapulars, back, rump, tail, wing-coverts and flight feathers appeared similarly uniformly black, rather than charcoal-grey as described by Morris & Hawkins (1998), but this could have been because of the strong ambient light. The bright white chin, collar and belly contrasted with the dark upper plumage. The legs and feet were dark grey. The iris appeared very dark but the exact colour was not determined.

The combination of dark bill and whitish chin and throat eliminates other *Xenopirostris* vangas, whilst the thick bill eliminates Western Tylas Vanga *Tylas eduardi albigularis.* Chabert's Vanga *Leptopterus chabert* is considerably smaller with a short bill and conspicuous blue eye-ring, except in the juvenile which has conspicuous white markings on the wings. There are no other confusion species.

The vanga was seen in mangrove forest consisting entirely of *Avicennia marina* trees 4–6 m tall. The tree in which the bird was perched was on the edge of a small (*c.*0.5 ha) open lake that was 20–60 cm deep. Similar-sized lakes were scattered throughout the forest. Healthy regeneration of young trees provided a dense undergrowth and complete canopy cover, apart from over the small lakes.

The substrate within the forest consisted of mud covered by 2 to 5 cm of water and was interspersed with a system of small shallow ponds (2–5 m in diameter) joined by small channels. The ponds were rarely deeper than 30–40 cm. The mangrove forest itself was only 2 m above high water. The forest was relatively undisturbed.

This sighting is significant as it represents the only record of Van Dam's Vanga in this area of Madagascar since the type specimens were collected in 1864. It is also the first record of this species in mangrove forest. Previous records suggested that Van Dam's Vanga is restricted to primary dry deciduous forest (Hawkins *et al.* 1990, Langrand 1990, Morris & Hawkins 1998).

Undisturbed mangrove forest along the north-western coast of Madagascar should not be overlooked as potential habitat for Van Dam's Vanga. Our finding of only one individual during our survey suggests that the species is rare in mangroves, similar to Western Tylas Vanga (Hawkins 1995). Nevertheless, if Van Dam's Vanga is utilizing significant areas of the extensive mangrove forest along the north-western coast of Madagascar, its global abundance may be greater than previously thought. Further surveys are clearly needed to confirm its conservation status.

Acknowledgements

We are grateful to Mr Ndramora and Mrs Begora Françoise for their hospitality during our stay in Ankazomborona. Without the expert guidance of Mr Adazandry Sola dit Zaman'i Ampemba, we would still be lost in the mangroves. We would like to thank Mr & Mrs Laurie Boswell of Nosy Be for their kind help. Richard Lewis and Joanna Durbin provided excellent support from the Durrell Wildlife Conservation Trust office in Antananarivo. Roger Safford's valuable comments greatly improved a previous draft.

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A previously unidentified museum specimen of Plain-tailed Nighthawk *Nyctiprogne vielliardi* (Caprimulgidae)

by Nigel Cleere

Received 29 July 2003

The Plain-tailed Nighthawk *Nyctiprogne vielliardi* is endemic to the rio São Francisco Valley in north-eastern Brazil and is probably the least known of all Neotropical nightjars (Cleere 1998, 1999, Holyoak 2001). It is also the most recent caprimulgid discovery from South America, two specimens, an adult male holotype and a juvenile male paratype, having been collected near Manga, Bahia in October 1987 and described within the genus *Chordeiles* seven years later (Lencioni-Neto 1994).

The species was next found near Januária, near Mocambinho and near Pirapora in northern Minas Gerais and studied in the field, although no new specimens were collected (Whitney *et al.* 2003). These studies also led to its generic reassignment from *Chordeiles* to *Nyctiprogne*, comments on the whereabouts of the two types and documented the existence of a third, hitherto unidentified museum specimen that was collected near Mocambinho, Minas Gerais in April 1994. The holotype was confirmed as being deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP), the paratype was reported as not being held in a public institution and the Mocambinho specimen was recorded from the Laboratory of Ornithology, Universidade Federal do Rio de Janeiro (UFRJ). No further localities or specimens are currently known for this taxon.

During an extensive examination of the Caprimulgidae material held in the American Museum of Natural History, New York (AMNH), I located a specimen from the rio São Francisco that matched the description of *Nyctiprogne vielliardi*.

The bird, an adult male (AMNH 241910) and labelled only as *Nyctiprogne*, was collected at Barra, Bahia, 430 m, by E. Kaempfer (field no. 5028) on 21 April 1926. I noted that it was extremely similar to *Nyctiprogne leucopyga* but lacked the white median tail-band of that species, although it had faint, vestigial white markings, below the uppertail-coverts on the inner webs of the four inner tail feathers (R1–R4). It also had a small buffish spot on either side of the lower throat. The biometrics were flattened wing 129 mm, tail length 86 mm and bill to skull 9.4 mm.

This newly identified specimen of *Nyctiprogne vielliardi* represents only the fourth known for this species and is the only one held outside of Brazil. It is also the oldest of the four and comes from a new locality along the rio São Francisco. Barra is situated at the mouth of the rio Grande (Paynter & Traylor 1991) and is approximately 160 km south of the type locality at Manga and 675 km north of Pirapora, which currently represent the northern and southernmost limits of this species' range.

Acknowledgements

I would like to thank Joel Cracraft for granting me access to the collections held in the American Museum of Natural History, and Paul Sweet and Peter Capainolo for all their help whilst working there. I am also extremely grateful to Robert Prŷs-Jones and Paul Salaman of The Natural History Museum/Project Biomap for giving me the opportunity to return to New York.

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Authors are invited to submit papers on topics relating to the broad themes of taxonomy and distribution of birds. Descriptions of new species of birds are especially welcome and will be given priority to ensure rapid publication, and may be accompanied by colour photographs or paintings.

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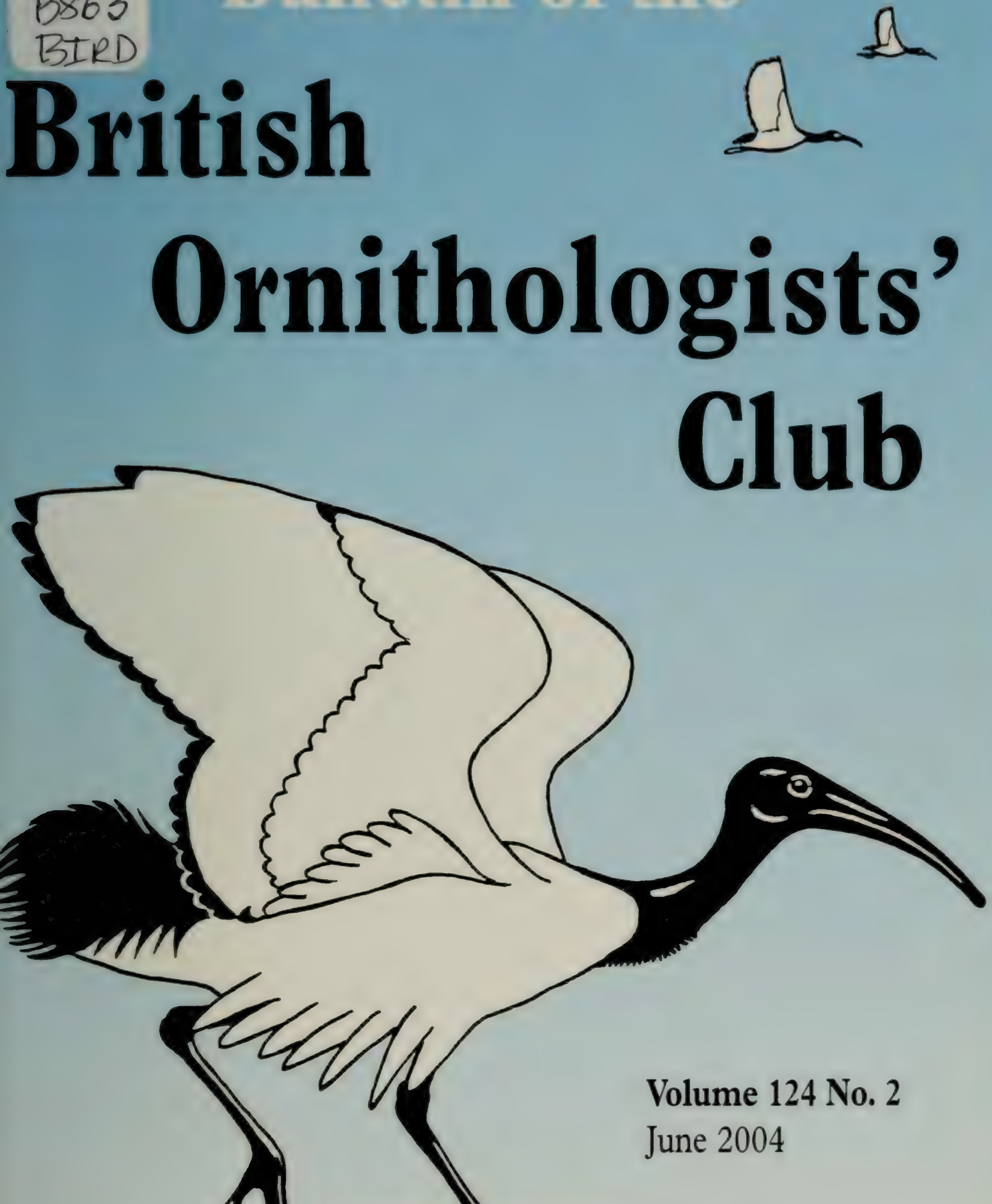

Volume 124 No. 2
June 2004

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London, SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. [Limited car parking facilities can be reserved (at a special reduced charge of **£5.00**), on prior application to the Hon. Secretary].

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm**. (A vegetarian menu can be arranged if ordered at the time of booking). Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges were increased to **£19.00**, as from **1st January 2004**.

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

Tuesday 22nd June—Dr P.J.K McGowan *Threatened pheasants and partridges in Asia*
Philip McGowan first encountered pheasants in Asia during two months fieldwork to plan the boundaries of the Great Himalayan National Park in Himachal Pradesh, NW India, in February/March 1983. Since then he has carried out surveys and intensive fieldwork on pheasants and partridges elsewhere in northern India, on Palawan in the Philippines, southwest China and in Malaysia. He compiled IUCN Action Plans for three groups of Galliformes and is now the Conservation Director of the World Pheasant Association. His role is to promote action on behalf of the world's Galliformes, which is amongst the most threatened of avian orders. On the current IUCN Red List 11% of bird species are considered at risk of extinction, whereas for the Galliformes it is 25%. The pressures seem most serious in Asia, where 50% of the world's pheasant species are listed as threatened.

Applications to Tony Statham (address below) *by **8 June**, please.*

Tuesday 28th September—Professor Glen Chilton *The curse of the Labrador Duck*
Glen Chilton is an Associate Professor of Biology at St Mary's College in Calgary, Canada. For the past 18 years, most of his research efforts have concerned the songs of birds, particularly the evolution of songs in crowned sparrows and New World warblers. This work has taken him to some of the most remote parts of North America. He is currently on a research sabbatical in the UK. Nine years ago, while constructing the species account of the extinct Labrador Duck for the *Birds of North America* series, he became fascinated by the stories associated with this species. They are stories of murder, theft, enormous wealth, and wartime crimes. Glen is now travelling the world to examine all remaining stuffed specimens, and is writing a book about his adventures.

Applications to Tony Statham (address below) *by **14 September** please.*

Future meetings in 2004. The following **Tuesdays** have been booked:
2 November—Robert C. Fleischer *Hawaiian bird evolution and conservation*
7 December—Dr A.G. (Andy) Gosler *Eggshell maculation in the Great Tit and other passerines*

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2005, giving as much advance notice as possible—please contact: Tony Statham, Woodcock Hill, Durrants Lane, Berkhamsted, Herts. HP4 3TR UK, (or e-mail: SAHS@tinyonline.co.uk).

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Bulletin of the
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CLUB ANNOUNCEMENTS

Subscription rates for 2005. As announced at the AGM (see Minutes below), subscription rates have remained constant since 1997, but an increase is now inevitable. The annual rates due on **1 January 2005** will be: £17.50 for BOU members, £24 for non-BOU members and £32 for libraries and institutions. Payment arrangements and Bankers Standing Order forms will be enclosed with the September issue of the Bulletin.

Changes to the Committee. Following the AGM (27 April 2004) the composition is now as shown on the inside rear cover. Please note the following two significant changes.

Hon. Secretary. As agreed at the AGM (27 April 2004), Tony Statham has now taken over from Michael Casement, but the latter will continue as Membership Secretary.

Hon. Publications Officer. James Jobling has stood down and his previous tasks reallocated.

BOC Publications. The BOU/BOC Joint Publications Committee (JPC) now handles production and sales of the Bulletin: c/o Steve Dudley, British Ornithologists' Union, Department of Zoology, University of Oxford, South Parks Road, Oxford OX1 3PS, e-mail: bocadmin@bou.org.uk.

Suggestions for future publications and policy should be referred to: Professor R. A. Cheke, BOC Hon. Publications Officer, Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, e-mail: r.a.cheke@greenwich.ac.uk.

Subscriptions from Libraries and Institutions and queries and requests for **Bulletin back numbers** should be sent to Steve Dudley, BOU Administrator, at the e-mail address shown above.

The 919th meeting of the Club was held on Tuesday 4 November 2003, in the Sherfield Building Annexe, Imperial College. 24 Members and 8 guests were present.

Members attending were: Dr C.F. MANN (*Chairman*), Miss H. BAKER, I.R. BISHOP, Ms D.V. BREESE, D.R. CALDER, Cdr. M.B. CASEMENT RN, Professor R.A. CHEKE, Captain N.G. CHESHIRE MN, D.J. FISHER, Dr C.B. FRITH, D. GRIFFIN, K. HERON, R.H. KETTLE, R.R. LANGLEY, D.J. MONTIER, Mrs M.N. MULLER, Dr R.P. PRŶS-JONES, Dr P.C. RASMUSSEN, Dr D.W. SNOW, S.A.H. STATHAM, C.W.R. STOREY, Dr D.H. THOMAS, Ms K. WAY and Cdr. F.S. WARD RN.

Guests attending were: Professor T.R. BIRKHEAD (*Speaker*), Mrs C.R. CASEMENT, Dr L. CORNWALLIS, Dr D.W. FRITH, Cdr. J.M. HAMMERSLEY RN, Mrs J. HAMMERSLEY, Mrs J.A. JONES, and Mrs M. MONTIER.

After dinner, Professor T.R. Birkhead entertained the meeting with an exceptionally interesting talk entitled *Darwin: Birds and Sexual Selection*. The following is a brief synopsis.

Darwin considered female animals to be sexually monogamous and hence he assumed that sexual selection ceased with mate acquisition. This view prevailed for the next 100 years. Then, in the late 1960s, coinciding with the focus on selection at the level of the individual, work undertaken by Professor Geoff Parker demonstrated that female insects often copulated with more than one male, providing an opportunity for post-copulatory sexual selection in the form of sperm competition. Since then the field of post-copulatory sexual selection has developed considerably, and it is now apparent that females of most species are promiscuous and that in addition to sperm competition the possibility that female choice of sperm (cryptic female choice) may also occur. Using examples from birds the speaker discussed the two key questions in this field: firstly, the adaptive significance of female promiscuity and, secondly, the mechanisms by which sperm competition and cryptic female choice occur.

The realisation that, despite their socially monogamous mating system, many birds are genetically promiscuous has transformed our understanding of their biology. It has, in addition, stimulated much new research across the entire spectrum of avian biology, from the anatomy and physiology of gametes and reproductive systems, to molecular biology, speciation, and the ecology and behaviour of mating systems.

The talk stimulated a lively question period, until the speaker had to leave in order to catch a train back to Sheffield.

The 922nd meeting of the Club was held Tuesday 23 March 2004, at the Rector's Residence, 170 Queensgate, Imperial College, London, attended by 27 Members and 12 guests.

Members attending were: Dr C.F. MANN (*Chairman*), Miss H. BAKER, Sir David BANNERMAN Bt., I.R. BISHOP, Mrs D.M. BRADLEY, Ms D.V. BREESE, D.R. CALDER, Cdr. M.B. CASEMENT RN, J.B. FISHER, F.M. GAUNTLETT, Reverend T.W. GLADWIN, A. GIBBS, D. GRIFFIN, B.H. HARLEY, R.H. KETTLE, D.J. MONTIER, Dr R.P. PRŶS-JONES, P.S. REDMAN, M.L. PALING, R.C. PRICE, P.J. SELLAR, T.R. SMEETON, S.A.H. STATHAM, Dr D.H. THOMAS, M.J. WALTON, R.W. WEBSTER and A.A. ZARRI.

Guests present were: Lady P. BANNERMAN, M. BRADLEY, Ms G. BONHAM, Mrs J.B. CALDER, Mrs C.R. CASEMENT, P.A. CLARKE, Mrs J.M. GLADWIN, Mrs A. HARLEY, Mrs M.H. GAUNTLETT, G. JATHAR, Mrs M. MONTIER and N. SNELL (*Speaker*).

After dinner, Nigel Snell gave a highly entertaining illustrated talk entitled *The return of the Red Kite*. The following is a brief synopsis.

Red Kites were once common in Britain but were wiped out in England and Scotland by the late-19th century. A handful of pairs remained in remote areas of Wales, where there was less persecution, but the high rainfall and poor food supplies meant that the Welsh population barely increased. In the late 1980s a group of conservation organisations, including the RSPB and EN, reintroduced Red Kites to England and Scotland. Much of southern England remains ideal for kites and the threat of persecution has receded. The project started in 1989 and, over six years, 93 young kites, mostly from northern Spain, were released in the Chilterns. Other releases took place at a site in northern Scotland. The project has proved successful with breeding pairs raising young in the wild as early as 1992. Since then the number of breeding pairs has increased each year.

Red Kites are mainly carrion feeders and spend hours circling like vultures, scanning the ground for animal remains. They will scavenge on anything, from the smallest bird or mammal to a dead sheep. Invertebrates, amphibians and fish are taken and invertebrates, such as earthworms, can form a significant part of their diet.

From late February, pairs of kites spend time in potential nesting areas calling and flying close together. Shortly before eggs are laid, wool is added to the nest, and kites can be seen in late March with long pieces of wool trailing behind them. Then, in June, when the chicks are 4–6 weeks old, the nest trees are climbed to ring them with a special metal ring and coloured plastic wing-tags, marked with a letter or number. In 2003, 177 breeding pairs were recorded, raising approximately 312 young—a mean 1.9 chicks per breeding pair.

The talk was followed by a lively and prolonged question and discussion period.

ANNUAL GENERAL MEETING 2004

1. **The Annual General Meeting** of the British Ornithologists' Club was held in the Sherfield Building, Imperial College, London SW7 on Tuesday 27 April 2004 at 6 p.m. with Dr C.F. Mann in the Chair. 18 Members were present. Apologies were received from: Dr P.G.W. Salaman, Professor C.J. Feare, Miss H. Baker, Mr J.B. Fisher and Professor J.H.R. Boswall.

The Minutes of the 2003 Annual General Meeting held on 29 April 2003, which had been published (*Bull. Brit. Orn. Cl.* 123: 66–67), were approved and signed by the Chairman.

2. **Chairman's report.** As shown in the Trustees' Annual Report, 2003 had been another very successful year for the Club, and the Hon Treasurer's accounts showed the finances to be in a healthy state, with an overall increase in total assets of £13,473. Profound thanks were due to David Montier and the Trustees of the Herbert Stevens Trust for their continuing expertise and hard work managing the Club finances. Speakers at dinner meetings had covered a wide range of interesting subjects and geographical areas, but the number of dinners had been reduced from eight to seven; average attendance had differed only marginally from previous years. Thanks were due to the staff of Imperial College for providing excellent facilities and meals for Club meetings, and also to Pat Sellar and Ron Kettle for assistance with audio-visual aids.

   The Chairman drew attention to several highlights of the past year, including the achievements of the BOU–BOC Joint Publications Committee in publishing the long-awaited and widely acclaimed conference proceedings *Why Museums Matter: Avian Archives in an Age of Extinction*, and two regional checklists. Last year's Bulletin, Vol. 123, was once again a source of pride, with an enhanced reputation for papers of high interest, and additional pages including colour plates. He paid generous tribute to Chris Feare for achieving these major improvements over the past five years, and sadness that he had now stepped down as Hon. Editor. But he welcomed Guy Kirwan to the meeting, who had now taken over, as from 1 January 2004.

   Another achievement was the electronic archiving of the Bulletin by Steven Gregory, assisted by Alistair Carr, who continued to make steady progress; the first CD-ROM covering the first 32 years (1892–1924) should be available for sale, shortly. The BOC website has been professionally enhanced, under the able direction of Paul Salaman, Hon. Website Manager, and continues to attract a growing number of visitors. Paul had also been responsible for the introduction of a trial scheme for free membership for one year for up to 50 students of ornithology. As a result 42 recommended students, from a wide range of countries, commenced their one-year membership as from 1 January 2004, and one (from India) had already attended a dinner meeting. Hopefully, at least some of these will wish to become full members in 2005. Membership numbers continued to fluctuate, now standing at 548, but with a net loss over the year of seven, including the death of eight long-serving and distinguished members.

   Regrettably it was necessary to review the rates for membership subscriptions, which no longer cover the rising costs of postage rates, and production of the greatly enhanced Bulletin. Having successfully held the subscription rates constant since 1997, an increase was now inevitable. The annual rates due on 1 January 2005 would be: £17.50 for BOU members, £24 for non-BOU members and £32 for libraries and institutions.

   The Chairman paid generous tribute to the enthusiasm and devotion of the Hon. Secretary, responsible for the general administration of the Club, but the workload was too heavy for one person, and it had been decided to split the membership tasks of this office. After eight years in office, Michael Casement was now standing down, to be relieved by Tony Statham, but Michael would continue as an *ex-officio* member of the Committee, as Membership Secretary, for another year to manage the change of subscription rates due for 2005. Thereafter much of the routine administration would be handled by a joint BOU/BOC administration office to share the costs for both organisations. Thanks were also due to James Jobling, Hon. Publications Officer, who was another key member standing down this year.

3. **Trustees' Annual Report for 2003.** Michael Casement pointed out that the Annual Report was now an integral part of the Annual Accounts, copies of which were before all Members present, and would be published in the June issue. He drew attention to some highlights of this report, noting in particular the continuing (small) decline in membership. Despite the popularity, especially with overseas members, the option to accept subscriptions for up to three years in advance had now been withdrawn. It had proved too costly to administer, because members found difficulty in recalling their last

payment dates, resulting in numerous reminder notices, or double-payments. A cause for concern was the number of overdue payments for 2004, which currently numbered 23. He called for any questions, but there was none.

The Annual Accounts for 2003. The Hon. Treasurer presented the accounts for the year ended 31 December 2003, and drew attention to the salient features, which were detailed in the paragraphs on finance in the Trustees' Report of Activities and Review of the Year. The adoption of the Accounts was proposed by David Montier, seconded by Clive Mann Chairman, and approved by all present.

4. **The Bulletin.** Guy Kirwan (GMK) referred to the section in the Annual Report contributed by his predecessor, Chris Feare (CJF). Since officially taking over on 1 January 2004, a total of 17 papers had been received (all by e-mail). CJF had served some extra time, as GMK was on field work at the time of the transfer, and the final stage of the handover was completed in early March. GMK now has copies of all outstanding and in-progress files, and lists of referees used by CJF.

   Of papers dealt with by GMK, four had been rejected and 11 accepted, of which five have been typeset and the rest are reaching various stages of completion. Three other papers, initially processed by CJF, have now been accepted and edited by GMK. Following previous policy, priority is given to papers describing new taxa, and a total of five of the 28 papers fell into this category.

   GMK took responsibility for proofing and liaison with Eng-Li Green (typesetter) for the March issue, Vol. 124 (1), and thus now has a strong appreciation of how things should work in the future. The turnaround in the final stages was quicker than normal, mainly as a result of both GMK and Crowes (printers) being based in Norwich. PDF copies of papers in the March issue have been distributed to authors, and this system now seems to be working well.

   Finally, GMK intends to promote the Bulletin by posting listings of papers in the 'latest' issue on publication on relevant Internet news groups, together with details of how to join the BOC. The Chairman thanked Guy for this encouraging progress report.

5. **Publications Report.** Tom Gladwin, Chairman of the Joint Publications Committee (JPC) confirmed that, as shown in the Annual Report, the joint procedures were working well and good progress was now being made towards achieving publication of the Bird Atlas of Uganda, in the autumn. The JPC was next due to meet in June.

6. **Election of Officers and Committee.** The Chairman said the proposed changes to the Committee were as published in *Bull. Brit. Orn. Cl.* 124 (1): 1.
   (i) Mr S.A.H. Statham be elected as Hon. Secretary (vice Cdr. M.B. Casement)
   (ii) Mr D.J. Montier be re-elected as Hon. Treasurer
   (iii) Professor R.A. Cheke be elected as Hon. Publications Officer (vice Mr. J.A. Jobling)
   (iv) Mr J.P. Hume to be elected vice Mr S.A.H. Statham
   (v) Cdr. M.B. Casement, OBE, RN, to continue (ex-officio) as Hon. Membership Secretary.
   These changes were approved unanimously.

7. **Under any other business**, Michael Casement said that, immediately following the meeting, there would be a demonstration of a PowerPoint projector, to be used for two of the mini-talks that evening. With the widespread use of this new technology, an increasing number of visiting Speakers were now asking for this facility to be provided, and the Committee needed to consider the costs of options for hire, or purchase of this equipment, for future dinners.

The meeting closed at 6.30 p.m.

BRITISH ORNITHOLOGISTS' CLUB
Founded 5 October 1892
Registered Charity No. 279583

TRUSTEES' ANNUAL REPORT FOR 2003

List of Trustees—Committee

Dr C.F. MANN *Chairman* (2001)
Mrs M.N. MULLER *Vice-Chairman* (2003)
Cdr. M.B. CASEMENT, OBE, RN, *Hon. Secretary* (1996)
D.J. MONTIER *Hon. Treasurer* (1997)
Professor R.A. CHEKE (2001)
Dr P.G.W. SALAMAN (2001)
I.R. BISHOP, OBE (2003)
S.A.H. STATHAM (2003)
C.W.R. STOREY (2003)
Ex-officio Reverend T.W. GLADWIN *Chairman* JPC (2002).

Correspondence and enquiries to the Hon. Secretary, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA

Auditors and Independent Examiners Porritt Rainey & Co, 9 Pembroke Road, Sevenoaks, Kent TN13 1XR

Bankers Barclays Bank plc, Dale House, Wavertree Boulevard, Liverpool, L7 9PQ

Constitution

The British Ornithologists' Club was founded in October 1892. It currently operates under Rules revised in 2000 and approved at a Special General Meeting on 31 October of that year. Members of the Committee, who are also the trustees of the Club, are listed above with the dates of their appointment. Committee members are elected for a term of four years, with the exception of the Hon. Secretary and Hon. Treasurer, who are both subject to re-election at each Annual General Meeting.

Objects of the Charity

The promotion of scientific discussion between Members of the British Ornithologists' Union and others interested in ornithology, and to facilitate the dissemination of scientific information concerned with ornithology, with a particular emphasis on avian systematics, taxonomy and distribution.

The Committee

The Committee met six times during the year. Mrs M.N. Muller was elected Vice-Chairman, in succession to the Reverend T.W. Gladwin, who was appointed an *ex-officio* member of the Committee in his capacity as Chairman of the BOU/BOC Joint Publications Committee (JPC). The Committee welcomed I.R. Bishop, S.A.H. Statham and C.W.R. Storey, in succession to J.A. Jobling and R.E. Scott, on completion of their terms of office, and Mrs M.N. Muller on her election as Vice-Chairman. Further discussions with the BOU were held to develop plans for sharing future administration costs for both societies.

Due to the commendable efforts of Dr P.G.W. Salaman (Hon. Website Manager), the BOC website was upgraded. The Committee is also deeply indebted to S.M.S. Gregory and M.A. Carr, who gave generously of their time and expertise to progress the electronic archiving and marketing of the complete set of Bulletin BOC.

The Committee continues to be most grateful to the Trustees of the Herbert Stevens Trust Fund (Mr Nigel Crocker, Mr Peter Oliver and Mr Richard Price) for their time and expertise advising on the performance of the Fund.

Meetings

The number of evening meetings held at Imperial College, London, was reduced from eight to seven in 2003. A total of 236 (167 members and 69 guests) attended these meetings, which represented an average attendance of 33.7. The programme of speakers during the year again covered a wide variety of ornithological subjects covering both Britain and overseas, including Madagascar, Hawaii and West Africa. As for the past four years, the 29 April meeting following the AGM took the form of a social evening, during which informal short talks and brief discussions were contributed by six participants, on a range of topical subjects. Summaries of all these talks are to be found in the Club Announcements section of the Bulletin. Following further cost increases by Imperial College, dinner charges for 2003 were increased to £18.50.

The Bulletin

Vol. 123 contained a bookshelf-bending 648 pages, thanks to an enlarged standard volume of 288 pages and a handsome supplement containing papers from the Why Museums Matter conference, comprising 360 pages. The supplement contained 21 papers and has received wide acclaim. Nigel Collar and Clem Fisher undertook all of the early stages of editing and they and the Hon. Editor are grateful for their valuable contribution.

The standard volume contained 39 papers and, as usual, both subjects and authors were representative of five continents. Topics covered a wide variety of aspects of taxonomy, nomenclature, distribution and behaviour, and included a description of a new subspecies of Udzungwa Forest Partridge from Tanzania. Once again colour illustrations were used where appropriate. The average interval between submission and publication was 14 months, ranging from eight to 19 months, representing a slight decrease on last year. However, members should note that this is a rapid turnaround compared with many journals, as the Bulletin interval is measured from submission to publication, whereas most journals quote the interval between acceptance and publication.

During 2003, 49 papers were received, representing a 32% increase over 2002 and a return to former levels of submission; 26 have so far been accepted with only four rejections. All papers, both of the standard volume and the supplement, were peer-reviewed as is customary in the Bulletin. The Editor thanks referees for their vital input, which is sometimes extensive and time consuming. In 2003 the submission of papers and their subsequent review were almost all completed electronically, in many cases leading to a rapid completion of manuscript processing. In extreme cases, the interval between submission to the Editor to his sending the final manuscript to the typesetter was as little as one month.

The combination of Alcedo and Crowes again worked extremely well in typesetting and printing respectively, and we now appear to have a satisfactory method of providing authors with 'reprints' of their paper in the form of PDF files. Mary Muller again prepared the index, Michael Casement the Club notices and Effie Warr assisted in a number of ways. The outgoing Editor thanks the Committee for its support throughout his tenure, and Eng-Li Green and Mike Dawson for the efficient and friendly way with which they have produced the final product.

Bulletin Sales

Subscriptions from Institutional Subscribers during 2003 totalled 113, with 21 in the UK and 92 overseas (27 different countries). Of the latter 39 were to the USA, seven each to Australia and to Germany, and four each to Canada, Norway and South Africa. So far, the sale of extra copies of *Bull. Brit. Orn. Cl.* 123A Supplement, *Why Museums Matter*, has totalled 41.

Other Publications

The BOC–BOU Joint Publications Committee (JPC) was formed in May 2002 under the chairmanship of the Reverend T. W. Gladwin, comprising: Miss. D.V. Breese, S.P. Dudley (Publications Manager), J.A. Jobling, Professor J. Kear (Checklist Editor), D.J. Montier and N.J. Redman. This joint committee, with a rotating chairmanship, has assumed responsibility for the management and production of all BOC publications and BOU Checklists. The JPC met twice in 2003, an encouraging year in which three titles were published. Significant progress was made towards the publication of other committed titles, and a number of new proposals were considered.

New Publications. The year saw the publication of the long-awaited conference proceedings *Why Museums Matter: Avian Archives in an Age of Extinction*, and two checklists, namely *The Birds of Morocco* and *The Birds of Hispaniola*. The close publication of two checklists in a two-month period was particularly demanding and is something the JPC would normally seek to avoid.

Forthcoming Publications. The conference proceedings *Climate Change and Coastal Birds*, previously reported by the JPC, are now to be published as an online only supplement of *Ibis* with the *Ibis* Committee overseeing its production. The checklists *The Birds of São Tomé and Príncipe and Annobón* and *The Birds of Borneo* have progressed as scheduled, and publication is anticipated in the first and second halves of 2004 respectively. After some regrettable delays, the JPC agreed at its June meeting that Steve Dudley, as Publications Manager, should take immediate control of the *Bird Atlas of Uganda*. Although much work was found to be outstanding, considerable progress has since been achieved, and publication is now anticipated in the second half of 2004. In view of possible similar forthcoming titles, and the particular scientific worth of atlases, this will now be published as the first in an Atlas series to be produced as joint BOC and BOU publications in parallel with the checklists.

Future Publications. Fifteen titles are currently being progressed or considered, with manuscripts for the two checklists, *The Birds of Benin* and *The Birds of Singapore*, now expected in 2004. The rate at which future titles are published will continue to be smoothed to match available funding.

Acknowledgements. The Committee is particularly grateful to Janet Kear and Steve Dudley for their continued management of the individual titles.

Membership

As at 31 December 2003, there were 548 paid-up Members: 299 with addresses in the UK and 249 overseas in 33 countries. The Club welcomed 24 new Members including two previous non-Members reinstated, but mourned the deaths in the past year of eight long-serving and distinguished Members: Dr Dean Amadon (1980–2003), Chris Mead (1964–2003, Committee 1971–75), G.S. Keith (1965–2003), Guy Mountfort, OBE (1951–2003, Hon. Life Member), Stephen Marchant (1957–2003), Dr Richard Liversidge (1951–55, 1977–2003), Captain Sir Thomas Barlow Bt. DSC, RN (1951–2003, Hon. Life Member) and Dr C.J.O. Harrison (1960–2003, Committee 1963–64, 1965–68, 1974–77, Hon. Secretary 1964–65). There were nine resignations, and 14 were removed under Rule 24, resulting in a net decrease in membership of seven during the year.

Finance

Total assets of the Club at 31 December 2003 totalled £357,360, compared with £343,887 at the end of 2002, an increase of £13,473. This improvement is the result of a welcome increase in the market value of investments, more than offsetting a deficit incurred on the Club's activities during the year.

Financial results for the year ended 31 December 2003

Total income for 2003 was £39,571. Subscriptions of £10,376 were fractionally lower than the previous year and again lower than the cost of producing the Bulletin, giving a shortfall on these two items of *c*.£1,000. Investment income of £16,163 included £10,419 from the Herbert Stevens and Barrington Trust Funds, which showed very little change from 2002. Interest on deposit accounts, however, increased by about £900 as a full-year's interest on the Clancey deposit compensated for the general decline in interest rates.

Income of £1,533 from sales of the Bulletin included the last transaction under the special sales offer that was so successful in 2002. Sales of other BOC publications increased from £566 to £1,501, with some two-thirds of the improvement coming from sales of *Why Museums Matter*, although much of the print run was allocated to Members and Institutional Subscribers as part of the annual Bulletin distribution. The first Checklists produced under the new BOU/BOC joint publication venture appeared during the latter part of the year and produced an income of £5,554 for the Club.

Expenditure of £47,395 was about £23,000 higher than in the previous year, the increase being almost entirely due to publication costs, consisting of *Why Museums Matter*, the printing of maps for the *Bird Atlas of Uganda* project and the Club's contribution towards the production of the BOU/BOC Checklist *The Birds of Morocco*.

Part of the cost of *Why Museums Matter* was allocated to the Publications and Clancey Funds, with a charge of £1,657 against each, while the cost of maps for the Uganda atlas, amounting to £3,441, absorbed most of the sponsorship money held in the Bird Atlas of Uganda Fund. Further costs that will be incurred in the production of the final work will be borne by Unrestricted Funds.

Administration costs during the year increased by £2,000 to £4,880. A large part of this was due to a full-year's charge for the Club's share of a joint storage facility with the BOU. Insurance costs also increased and the website was professionally redesigned. The net result for the year was an overall deficit on normal activities of £7,824, which appears startling against a surplus of £64,840 in the previous year, but that included the Clancey legacy of £49,056 and no new publications.

Investments

A long-awaited upturn in the world's stock markets resulted in an increase of £21,297 (11.33%) in the charity unit trusts held in the Herbert Stevens and Barrington Trust Funds, taking their market value at 31 December 2003 to £209,317 as against £188,020 a year earlier. This encouraging turnaround recouped *c.*40% of the losses suffered during the previous two years. In the balance sheet, total investments are stated at £258,317 and, as shown in note 2 to the accounts, include £49,000 from the Clancey bequest that continues to be held in a fixed rate Building Society deposit.

Risk Review

The Committee has reviewed the major risks to which the Club is exposed, and operates systems that are designed to mitigate those risks.

Trustees' Responsibilities

Under the Charities Act 1993, the Trustees are required to prepare a statement of accounts for each financial year which give a true and fair view of the state of affairs of the charity at the end of the financial year and of the incoming resources and application of resources in the year. In preparing the statement the trustees are required to.

- Select suitable accounting policies and then apply them consistently;
- Make judgements and estimates that are reasonable and prudent;
- State whether applicable accounting standards and statements of recommended practice have been followed, subject to any material departures disclosed and explained in the statement of accounts;
- Prepare the financial accounts on the going concern basis unless it is inappropriate to presume that the charity will continue its operations.

The Trustees are responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the charity and to enable them to ensure that any statement of account prepared by them complies with the regulations under section 41(1) of the Charities Act 1993. They are also responsible for safeguarding the assets of the trust and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Approved and signed on behalf of the Trustees

C. F. Mann
Chairman

Date: 27 April 2004

BRITISH ORNITHOLOGISTS' CLUB
BALANCE SHEET—31 December 2003

	Notes	**2003** £	£	*2002* £	£
INVESTMENTS					
At market value	2		**258,317**		*237,020*
CURRENT ASSETS					
Stock of publications		**100**		*100*	
Cash at bank and in hand		**3,143**		*2,222*	
Cash on deposit		**101,368**		*111,377*	
Prepayments		**338**		*312*	
Other debtors		**880**		*862*	
		105,829		*114,873*	
CURRENT LIABILITIES					
Subscriptions in advance		**(3,589)**		*(3,376)*	
Creditors falling due within one year		**(3,197)**		*(4,630)*	
			99,043		*106,867*
TOTAL ASSETS			**357,360**		*343,887*
FUNDS					
Unrestricted					
Designated	3		**15,000**		*15,000*
Other	4		**287,773**		*269,843*
			302,773		*284,843*
Restricted	5		**54,587**		*59,044*
			357,360		*343,887*

Approved and signed on behalf of the Trustees

C. F. Mann
Chairman

Date: 27 April 2004

STATEMENT OF FINANCIAL ACTIVITIES—31 December 2003

	Notes	**2003** **Unrestricted** £	**Restricted** £	**Total** £	*2002* *Total* £
INCOMING RESOURCES					
SUBSCRIPTIONS					
Members		**7,067**	-	**7,067**	*7,051*
Institutional subscribers		**2,768**	-	**2,768**	*2,916*
Income Tax recoverable				-	
Under Gift Aid & Deeds of Covenant		**541**	-	**541**	*575*
		10,376	-	**10,376**	*10,542*
LEGACY RECEIVED		-	-	-	*49,056*
DONATIONS		**135**	-	**135**	*64*

INVESTMENT INCOME					
Herbert Stevens Trust Fund		**10,383**	**-**	**10,383**	*10,332*
Barrington Trust Fund		**36**	**-**	**36**	*36*
Interest received		**3,446**	**2,298**	**5,744**	*4,802*
		13,865	**2,298**	**16,163**	*15,170*
SALES OF PUBLICATIONS					
Bulletin		**1,533**	**-**	**1,533**	*8,552*
Other BOC publications		**1,501**	**-**	**1,501**	*566*
Joint BOU/BOC Checklists		**5,554**	**-**	**5,554**	*-*
		8,588	**-**	**8,588**	*9,118*
MEETINGS		**4,227**	**-**	**4,227**	*5,248*
OTHER INCOME		**82**	**-**	**82**	*60*
TOTAL INCOME		**37,273**	**2,298**	**39,571**	*89,258*
RESOURCES EXPENDED					
CHARITABLE EXPENDITURE					
MEETINGS					
Room and equipment hire, speakers' expenses, etc.		**1,495**	**-**	**1,495**	*1,623*
Restaurant		**4,376**	**-**	**4,376**	*5,170*
BOC BULLETIN					
Production, printing and distribution		**11,245**	**-**	**11,245**	*12,589*
Costs related to special sales offer of back numbers		**-**	**-**	**-**	*2,058*
OTHER PUBLICATIONS					
Purchases, including Bulletin Supplement 123A *Why Museums Matter*		**17,093**	**6,755**	**23,848**	*65*
Publicity, postage and packing		**1,551**	**-**	**1,551**	*80*
ADMINISTRATION	6	**4,880**	**-**	**4,880**	*2,833*
TOTAL EXPENDITURE		**40,640**	**6,755**	**47,395**	*24,418*
EXCESS OF EXPENDITURE OVER INCOME		**(3,367)**	**(4,457)**	**(7,824)**	*64,840*
Increase / (decrease) in value of investments		**21,297**	**-**	**21,297**	*(31,077)*
		17,930	**(4,457)**	**13,473**	*33,763*
TOTAL FUNDS brought forward at 1 January 2003		**284,843**	**59,044**	**343,887**	*310,124*
TOTAL FUNDS at 31 December 2003		**302,773**	**54,587**	**357,360**	*343,887*

NOTES TO THE ACCOUNTS—31 December 2003

1. ACCOUNTING POLICIES

a) Basis of Accounts. The Financial Statements are prepared under the historical cost convention as modified by the inclusion of investments in the Herbert Stevens and Barrington Trust Funds at market values. They are also prepared in accordance with the Financial Reporting Standard for Smaller Entities (effective June 2002) and follow the recommendations in *Accounting and Reporting by Charities: Statement of Recommended Practice* issued in October 2000.

b) Investments and Cash Deposits. The Herbert Stevens and Barrington Trust Funds are invested in quoted charity unit trusts and included as investments in the Balance Sheet at year-end market values. Income from these funds and from cash deposits shown in the Balance Sheet under Current Assets is included in Incoming Resources in the Statement of Financial Activities on a receipts basis. The Clancey Bequest is held in a fixed-term, Building Society deposit account, which forms part of the total of investments in the Balance Sheet. Interest on this deposit account is brought into the Statement of Financial Activities on an accruals basis.

c) Subscriptions. Subscriptions for the current year and any arrears are included in Incoming Resources in the Statement of Financial Activities. Subscriptions received in advance are carried forward in the Balance Sheet as Current Liabilities.

d) Expenditure is accounted for on an accruals basis.

e) Publications. The cost of publications is written off in the Statement of Financial Activities as incurred except for a nominal stock value of £100 carried in the Balance Sheet.

2. INVESTMENTS—at market value

	2003	*2002*
	£	*£*
UNRESTRICTED FUNDS		
Herbert Stevens Trust Fund	**208,377**	*187,174*
Barrington Trust Fund	**940**	*846*
RESTRICTED FUNDS		
Clancey Bequest	**49,000**	*49,000*
	258,317	*237,020*

All investments are held in the UK.

3. UNRESTRICTED DESIGNATED FUND

for future publications

	2003
	£
Balance at 1 January 2003	**15,000**
Designated during the year	-
Balance at 31 December 2003	**15,000**

4. OTHER UNRESTRICTED FUNDS

	General Fund	Herbert Stevens Trust Fund	Barrington Trust Fund	Total
	£	**£**	**£**	**£**
Balances at 1 January 2003	81,823	187,184	846	269,843
Increase in value of investments during year	-	21,203	94	21,297
Excess of expenditure over income	(3,367)			(3,367)
Balances at 31 December 2003	**78,456**	**208,377**	**940**	**287,773**

5. RESTRICTED FUNDS

	Clancey Bequest	Publications Fund	Bird Atlas of Uganda Fund	Total
	£	**£**	**£**	**£**
Balances at 1 January 2003	49,999	5,443	3,602	59,044
Allocated against costs of:				
Bulletin Supplement 123A *Why Museums Matter*	(1,657)	(1,657)	-	(3,314)
Preparation of maps for *Bird Atlas of Uganda*	-	-	(3,441)	(3,441)
Interest received	2,078	178	42	2,298
Balances at 31 December 2003	50,420	3,964	203	54,587

a. The Clancey bequest was donated by the late Dr P.A. Clancey with the request that it should be used to support and enhance the Club's Bulletin.
b. The Publications Fund is available to finance Club publications other than regular issues of the Bulletin.
c. The Bird Atlas of Uganda Fund is specifically to assist with financing the production and publication of the Atlas.

6. ADMINISTRATION EXPENSES include:

	2003	*2002*
	£	*£*
Club's share of cost of fitting out and rental of storage unit	**1,744**	*916*
Audit and Independent Examination fees	**550**	*550*
Other administration expenses	**2,586**	*1,367*
	4,880	*2,833*

7. REIMBURSEMENT OF EXPENSES

No Committee member receives any remuneration but they are reimbursed for expenses incurred by them on behalf of the Club.

The amount reimbursed during the year was £1,285 (2002 £1,320).

INDEPENDENT EXAMINERS REPORT TO THE TRUSTEES OF THE BRITISH ORNITHOLOGISTS' CLUB

I report on the accounts of the Club for the year ended 31 December 2003, which are set out on pages 7–12.

Respective responsibilities of trustees and examiner

The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under section 43(2) of the Charities Act 1993) and that an independent examination is needed. It is my responsibility to:

- Examine the accounts (under section 43(3)(a) of the 1993 Act);
- To follow the procedures laid down in the General Directions given by the Charity Commissioners (under section 43(7)(b) of the 1993 Act); and
- To state whether particular matters have come to my attention.

Basis of independent examiners' report

My examination was carried out in accordance with the General Directions given by the Charity Commissioners. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and the seeking of explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit and, consequently, I do not express an audit opinion on the view given by the accounts.

Independent examiners' statement

In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements:
- to keep accounting records in accordance with s41 of the 1993 Act; and
- to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 1993 Act have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Alan Peal ACA—Principal
Porritt Rainey & Co. Chartered Accountants

Date: 27 April 2004

A new species of scops-owl from Sri Lanka

by Deepal H. Warakagoda & Pamela C. Rasmussen

Received 3 March 2004

On 27 February 1995, DHW first heard and made a tape-recording of an unfamiliar owl-like vocalisation at night in Kitulgala Proposed Reserve (P.R.), a rainforest in the wet zone of Sri Lanka. Over the next six years at this site and at Sinharaja Forest Reserve (F.R.), a large rainforest, DHW several times heard this mysterious call, which did not match that of any known Sri Lankan owl, but he was unsuccessful in observing its author. DHW played the tape-recording to other naturalists in Sri Lanka, only one of whom indicated he had heard the same call, but this person had assumed it was an arboreal amphibian. After comparing it with recordings of vocalisations of many Asian owls (in Marshall 1978 and White 1984), DHW believed that the unknown Sri Lankan vocalisation was most similar to that of the Reddish Scops-owl *Otus rufescens*, a species from the Malay Peninsula and Greater Sundas. In late 2000, DHW sent a tape-recording of the mysterious call to PCR, who agreed that the call sounded like an owl but that it did not match any of the species known to occur in Sri Lanka, and was most like *O. rufescens*. The possibility of a new species of owl in a country as well known ornithologically as Sri Lanka (where the last new bird species was described as long ago as 1868) seemed very remote. However, scops-owls are notoriously easily overlooked and some species are cryptically similar.

Eventually, at Sinharaja F.R. on 23 January 2001, DHW was successful in observing well for several minutes a bird in the act of giving this call, and he was also able to show the bird to E. L. Hagen. It was a very small rufous earless owl, quite unlike any other on the island or anywhere in South Asia. DHW then visited Kitulgala P.R. with colleagues, including wildlife photographer Chandima Kahandawala, who on 11 February 2001 obtained numerous excellent photographs of an individual bird from many different angles. From these photographs, we confirmed that the owl is strikingly distinct in numerous characters from any other Sri Lankan species. Among other scops-owls, it appears most similar overall to *O. rufescens*, and yet shows numerous differences from even that species. Although no ear-tufts are visible in life, we initially believed (but could not confirm) that it belonged to the genus *Otus* based on its overall appearance and vocalisations, an opinion that has been borne out by further study (detailed below). When we were certain that it was a new species, a press release resulted in numerous articles in various media, and preliminary papers on the discovery of the owl were published (e.g. Warakagoda 2001a–e).

A study was launched by DHW and colleagues, under the auspices of the Department of Wildlife Conservation (DWLC) and Forest Department (FD) of Sri Lanka, to investigate the status, distribution, biology, ecology and taxonomy of the new owl. Explorations were carried out in rainforests (all such forests in Sri Lanka

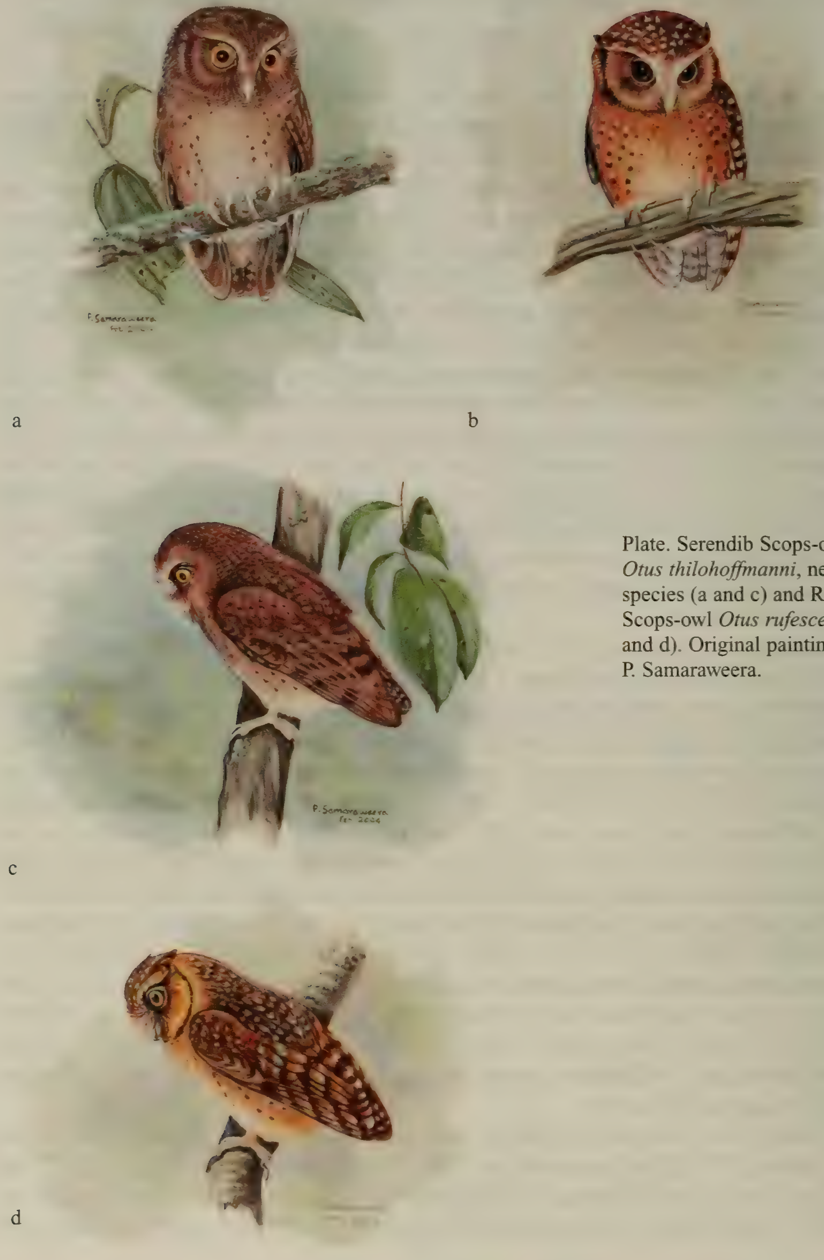

P. Samaraweera
Feb 2004
a
b
P. Samaraweera
Feb 2004
c
d

Plate. Serendib Scops-owl *Otus thilohoffmanni*, new species (a and c) and Reddish Scops-owl *Otus rufescens* (b and d). Original painting by Dr P. Samaraweera.

being in its wet zone), lower montane forests and montane forests of the wet zone, and moist semi-evergreen and riverine forests of the intermediate (climatic) zone. On 4 August 2001 a male of the species was mist-netted (Fig. 1; see also Appendix) in Morapitiya-Runakanda P.R. for further studies of the taxon's external morphology. It was photographed, ringed, and released at the exact site of capture. Biometrics, descriptions and photographs of this individual were sent to PCR for further comparative studies. Incidentally, this individual was relocated 2.5 years later in apparent good health at the same locality.

Searches at museums with significant holdings of Sri Lankan birds revealed no overlooked specimens of this taxon that could be used as the basis for a scientific description. Given the distinctiveness of the owl, we believe it is unlikely that any such misidentified specimens exist. Therefore it was essential to collect a specimen of the new owl, but we were reluctant to do so at this stage because its population and conservation status were unknown. By May 2002 the results of our project showed that the new owl occurred in at least five different forests, and at least 24 individuals had been detected. Permission to collect a specimen to be designated the type was then applied for and granted by the DWLC and FD. DHW and colleagues obtained the specimen in November 2002 at Morapitiya-Runakanda P.R., a site they had found to hold one of the larger populations known by then. For this distinctive new species, we propose the name:

Serendib Scops-owl *Otus thilohoffmanni*, sp. nov.

Holotype National Museum, Colombo, no. 381, female, from Morapitiya-Runakanda Proposed Reserve (06°29'N, 80°18'E, 100 m a.s.l.), Sri Lanka, collected 9 November 2002 by Deepal H. Warakagoda, Kithsiri Gunawardena, Nanda Senanayake, Udaya Sirivardana and Niran M. C. Caldera. The type specimen was prepared as a full skin and partial skeleton (the skull minus the bill was retained with the skeleton), and tissue samples were preserved from liver, breast muscle and blood.

Diagnosis A small, short-tailed, rather uniformly rufescent scops-owl with eye colour ranging from yellow to orange (according to sex), lacking apparent ear-tufts, with a weakly defined facial disk, and with weak tarsi feathered for less than half their length (Plate, Fig. 1).

The upperparts are almost uniformly rufous marked overall with small, short blackish chevrons, spots and/or bars, but lacking white spots, and the scapular spots are obsolete; the wings and tail have rufous outer webs and mostly blackish inner webs, with broad, evenly spaced, rather weak rufous and blackish bands; the underparts are somewhat paler rufous than the upperparts and fairly uniformly sprinkled with blackish triangular spots; the central belly and undertail-coverts are paler and unspotted. The head is rounded and fairly uniformly rufescent, with white supercilia (conspicuous to weak in live birds according to facial expression); no ear-tufts; bar-like chevrons on the central crown; a uniform, slightly darker rufous facial disk, devoid of markings and lacking a dark facial disk border; feathers around base of bill concolorous with those of facial disk. The large eyes have yellow to orange irides, with a striking black outer ring. The orange of the iris is concentrated especially in the sides and lower part of the iris, shading to yellow in the rest of the iris. In males the orange is pronounced, the area apparently growing larger with age and eventually covering the whole iris; in the females the iris is entirely or largely yellow with much less orange than in the male. The inner eyelids are black, whilst the bare orbital ring is narrow and pinkish. The cere is fleshy pink and not strongly demarcated from the bill, which is ivory-white in live birds and notably long, narrow and relatively straight for its genus. In live birds, the tarsi and toes are pinkish white, the claws ivory white, all becoming pinker post-mortem. The tarsi, toes and claws are strikingly thin and delicate, the toes appear long, and the claws are relatively straight; less than the proximal half of the tarsi is feathered. In normal postures in life, the wingtips fall slightly beyond the tail tip.

In overall coloration, *Otus thilohoffmanni* resembles several other species, in particular *O. rufescens*, Sokoke Scops-owl *O. ireneae* (rufous morph), Sandy Scops-owl *O. icterorhynchus*, Pemba Scops-owl *O. pembaensis* (rufous morph), Mountain Scops-owl *O. spilocephalus* (rufous morph of races from the central Himalayas through south-east Asia), Flores Scops-owl *O. alfredi*, and White-fronted Scops-owl *O. sagittatus*. Among Sri Lankan species, the only species with which *thilohoffmanni* could be confused is the Sri Lankan race of Oriental Scops-owl *Otus sunia leggei* in the rufous morph.

Otus thilohoffmanni differs from *ireneae* (rufous morph) in its pale (vs. dark) bill and claws; lack of ear-tufts (vs. short but distinct ear-tufts); more profuse rictal and other facial bristles, and less defined facial disk; darker, less bright rufous overall coloration; lack of black streaks on the forehead and upperparts; much weaker, more rufous wing banding; blackish inner portions of remiges and rectrices; lack of weak fine dark barring below; and mostly unfeathered tarsi (vs. feathered to toes). It differs from *icterorhynchus* in lacking ear-tufts (vs. having long, prominent, upstanding ear-tufts), having almost uniform forehead and crown (vs. 'frosted' white forehead and crown-sides), having longer facial bristles and less distinct facial disk rim, lacking white diamond-shaped spots above, lacking prominent white scapulars with black tips, lacking prominent white banding on wings, having more and larger black spots on underparts, and lacking white spotting on breast and white barring on lower underparts.

Differences from *pembaensis* (rufous morph) include the much smaller size of *thilohoffmanni*; lack of ear-tufts; lack of black border around facial rim; darker, more rufous, more uniform facial disk; near lack of pale scapular spots; lack of fine dark shaft-streaks and pale barring below; more distinctly barred uppertail surface, much smaller, pale bill; much less extensively feathered, weaker tarsi; and paler, weaker toes.

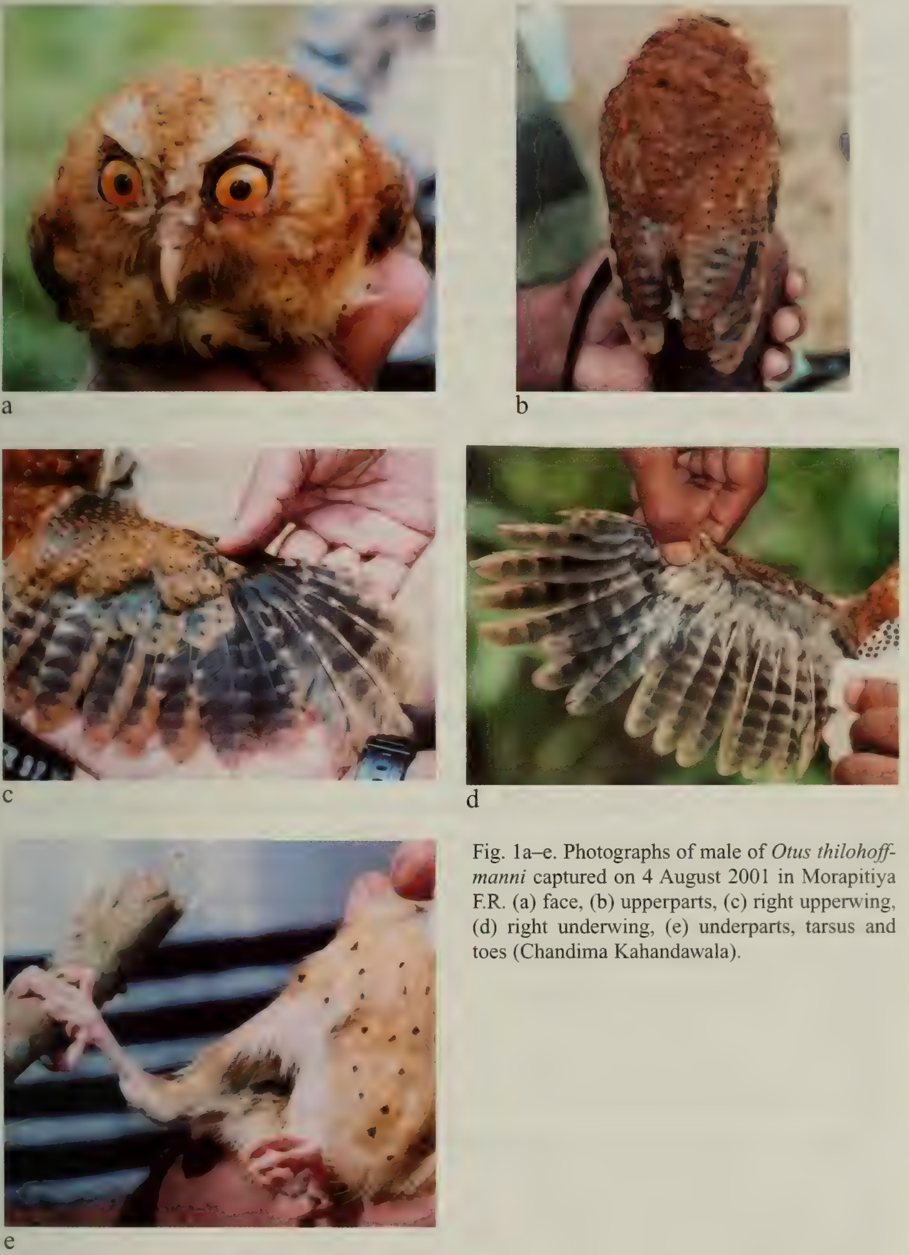


Fig. 1a–e. Photographs of male of *Otus thilohoffmanni* captured on 4 August 2001 in Morapitiya F.R. (a) face, (b) upperparts, (c) right upperwing, (d) right underwing, (e) underparts, tarsus and toes (Chandima Kahandawala).

Differences from *alfredi* include the orange eye of males (vs. yellow); paler, less orange-yellow bill; shorter facial bristles and more compact plumage texture (vs. long soft bristles and softer, fluffier overall plumage in *alfredi*); more uniformly rufous face (vs. prominent white-'frosted' forehead and supercilia and darker patch around eye in *alfredi*); presence of black chevrons on upperparts; lack of diamond-shaped spots on nape collar; obsolete scapular spots (vs. strong brown and white spots in *alfredi*); lack of white banding in wing; much more uniform underparts that lack the white patterning and vermiculation of *alfredi*; black spots below (lacking in *alfredi*); and much less heavily and extensively feathered tarsi.

Differences from *spilocephalus* (rufous morph of continental races) include lack of ear-tufts, near lack of scapular spots (white with black tips in *spilocephalus*), more uniformly rufous upperparts with narrow chevrons and other bar-like marks (vs. large dark brown spots on crown, distinct pale-spotted nape collar, and more irregularly barred upperparts in *spilocephalus*), much more uniformly coloured and patterned underparts (vs. mostly very finely vermiculated, with irregular white spots and chevrons below in *spilocephalus*, with more solid-coloured dark breast patches and white patches in centre of belly and vent, and a lack of black spots); tarsus much less heavily feathered (vs. nearly entirely feathered in continental races of *spilocephalus*).

From *sagittatus*, *thilohoffmanni* differs in its much smaller size (especially the much shorter tail); much plainer face pattern; dark eye patch; mostly whitish, finely vermiculated facial disk with prominent dark brown border; lack of ear-tufts; brighter, paler rufous upperparts (darker, more maroon-chestnut in *sagittatus*); lack of pale arrowhead-shaped marks on upperparts and presence of black chevrons above; near lack of scapular spots (buffy and irregularly marked but prominent in *sagittatus*); plainer underparts pattern lacking vermiculation on breast and with stronger blackish spotting below; and much less extensively feathered, much weaker tarsi. From *O. sunia leggei* (rufous morph), it differs in lacking the prominent ear-tufts, and in lacking dark streaking and white barring to the underparts.

The only species that bears a sufficiently close resemblance to *O. thilohoffmanni* in external morphology to warrant detailed comparisons is *O. rufescens* of Malaysia and the Greater Sundas. The following results from direct comparisons by PCR of the type specimen of *thilohoffmanni* with 11 specimens of *O. rufescens* (one at USNM, four at AMNH, and six at BMNH [all acronyms are explained in the Acknowledgements]), and comparison with photos of ten adult specimens of *rufescens* at NNM and another at ZMA (*rufescens* is itself scarce in collections and few specimens exist beyond those examined in this study). Among the specimens of *rufescens* examined, only minor variation exists in colour and pattern, although it has been considered to have rufous and brown morphs (König *et al.* 1999). The type specimen of *thilohoffmanni* is very similar in colour and pattern to all ten living individuals of the species thus far observed by DHW and colleagues, and it seems most likely that the species lacks colour morphs. All other known scops-owls are more dissimilar in appearance to *thilohoffmanni* than are the above.

TABLE 1

Skin measurements (in mm) of type specimen of *O. thilohoffmanni* and similar species. Measurements taken of live bird by DHW are included below those of the type; where two measurements are presented, these are of left then right sides respectively. L = length, d = depth, w = width, P = primary (numbered from outer primary inward), s = shortfall (distance from wingtip).
Data on *O. alfredi* from Widodo *et al.* (1999) and PCR (unpubl. data); data on *O. pembaensis* from Rasmussen *et al.* (2000).

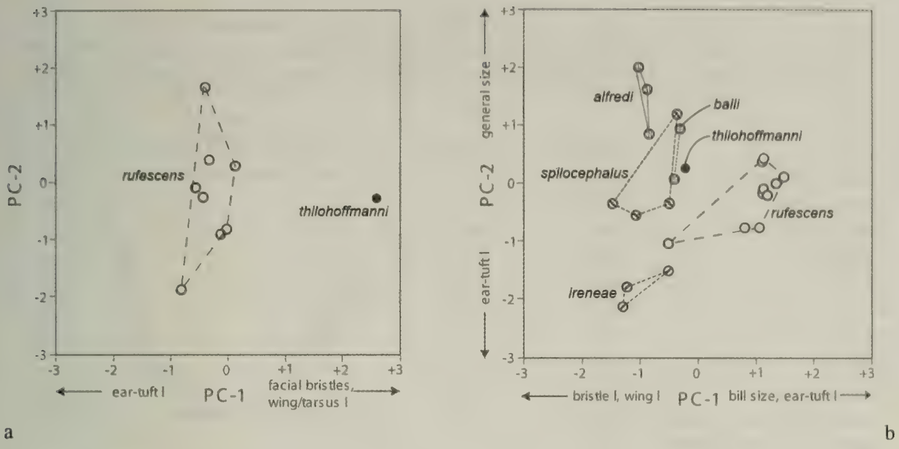
Species	Culmen l from cere	Maxilla d at cere	Rictal bristle l	AuricularBristle l	Ear-tuft l	Wing l	Tail l	Tarsus l	Tarsus proximal w	Tarsus distal w	Unfeathered tarsus	Digit 2 (toe) l	Digit 2 claw l	Hallux claw l	P1l	P1s	P2s	P3s	P4s	P5s	P6s	P7s	P8s	P9s	P10s
Type of *thilohoffmanni*	12.9	7.1	24.8	17.1	23.2	129	63	27.7	5.4	6.2	16	23.7	11	8.1	54	37	19	6	1	0	1	6	13	18	24
Live *thilohoffmanni* (DHW)	---	6.5	13.1	---	---	140, 135	66	33.8 (x2)	---	---	23.5, 19.2	---	11, 11.3	8.7, 9	---	---	---	---	---	---	---	---	---	---	---
rufescens	13.8	7.3	18.0	14.0	27.5	123.7	65.0	24.8	5.7	6.6	5.9	21.4	11.0	9.1	50.4	36.8	17.8	5.4	1.0	0.4	2.6	5.0	10.1	15.1	21.8
SD	0.5	0.2	1.7	1.3	3.3	3.7	3.3	1.25	0.5	0.7	2.0	1.4	0.8	0.7	2.8	2.3	1.4	2.1	1.2	0.8	3.4	3.7	3.2	3.7	2.6
(n)	(13)	(13)	(13)	(13)	(14)	(12)	(10)	(12)	(10)	(12)	(11)	(6)	(12)	(9)	(7)	(7)	(7)	(8)	(8)	(10)	(7)	(6)	(7)	(7)	(7)
ireneae	10.3	5.8	21.1	19.4	19.7	116	63	21.4	4.8	5.4	3.4	15.7	8.8	8.2	39.0	37.0	18.3	4.7	0.5	0.0	---	---	---	---	---
SD	0.7	0.5	1.2	1.2	1.1	1	2.6	1.5	0.1	0.2	0.6	0.6	0.4	10.6	5.3	3.0	1.5	2.3	0.7	0.0	---	---	---	---	---
(n)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(2)	(3)	(3)	(3)	(3)	(2)	(2)					
icterorhynchus	---	---	16.0	16.3	22.5	122	72	---	---	---	---	---	---	---	55.0	36	15	5	2	0	2	6	11	16	18
balli	12.2	6.8	23.3	15.8	25.5	141.5	72.5	29.6	5.5	6.6	12.3	---	9.9	8.4	60	38	14	5	0	0	3	4	9	24	32
SD	1.3	0.1	2.3	1.0	1.0	0.7	---	0.4	0.7	0.3	0.6	---	0.6	0.4	---	---	---	1.4	0.0	---	---	---	---	---	---
(n)	(2)	(2)	(2)	(2)	(2)	(2)		(2)	(2)	(2)	(2)		(2)	(2)				(2)							
alfredi	12.7	6.9	27.8	---	21.1	149.2	75.4	25.6	6.1	6.4	8.5	---	10.1	8.5	61.4	45.4	23.2	8.2	1.5	0	3.4	10.2	18.0	25.1	34.6
SD	1.1	0.3	1.7	---	1.0	10.0	4.3	1.2	0.4	0.1	1.6	---	0.8	0.4	3.8	4.0	2.0	1.4	1.8	0	2.2	2.6	2.6	2.2	3.0
(n)	(4)	(3)	(4)		(3)	(4)	(4)	(4)	(3)	(3)	(3)		(4)	(3)	(3)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
spilocephalus (continental races)	2.1	5.7	23.3	25.7	25.0	143.0	78.2	30.1	---	5.6	6.4	---	10.0	---	56.8	44.3	19.8	6.9	1.3	0.0	3.5	10.2	18.3	25.1	31.3
SD	0.3	1.5	2.6	2.9	2.9	4.9	3.7	1.4	---	0.1	1.3	---	0.6	---	3.2	3.1	2.6	1.7	1.1	0.2	1.2	1.7	2.1	2.5	2.9
(n)	(4)	(4)	(32)	(21)	(32)	(48)	(13)	(11)		(3)	(13)		(13)		(37)	(38)	(36)	(46)	(38)	(38)	(37)	(3)	(32)	(27)	(26)
pembaensis	---	7.6	21.8	14.4	24.7	151.5	75.0	28.3	---	7.4	4.1	---	10.6	8.9	69.8	33.5	11.0	2.1	0	1.6	7.0	12.8	19.3	26.5	32.3
SD	---	0.3	0.9	0.6	1.0	2.7	1.6	1.3	---	0.2	0.8	---	0.5	0.4	4.2	2.3	1.	0.5	0	0.9	0.6	1.2	1.6	2.3	2.7
(n)		(6)	(6)	(6)	(6)	(6)	(6)	(6)		(6)	(6)		(6)	(6)	(6)	(6)	(6)	(5)	(6)	(6)	(6)	(6)	(6)	(6)	(6)

The bill of *thilohoffmanni* is markedly narrower, less arched, and appears longer and straighter near the tip than that of *rufescens*. The rictal bristles of *thilohoffmanni* are slightly to much longer than those of *rufescens*. The facial disk of *thilohoffmanni* lacks any hint of a dark rim and the feathers are uniform in colour throughout their length (vs. a moderately prominent dark rim to the facial disk, with the facial disk feathers palest immediately proximal to the dark rim in *rufescens*), thus *thilohoffmanni* has a much plainer, more uniform facial pattern than *rufescens*. The feathers of the facial disk rim of *thilohoffmanni* are softer and less stiffened, and diffuse-tipped with slightly lengthened shafts or auricular extensions (vs. stiffened, with straight, compact tips in *rufescens*). The pale supercilium and front of the forehead of *thilohoffmanni* are weaker, more rufescent, and more barred than in *rufescens* (which has very prominent whitish supercilia), and show less contrast with the crown colour and pattern. In *thilohoffmanni*, the feathers that would in other scops-owls be elongated as ear-tufts are essentially undifferentiated, being marked as for adjacent feathers (but perhaps slightly more heavily barred than surrounding feathers), soft and unstiffened, with rounded tips like the adjacent feathers (vs. rather long and pointed, stiff ear-tufts with specialised markings in *rufescens*).

The feathers of the upperparts of *thilohoffmanni* entirely lack whitish subterminal triangles (vs. prominent and generally distributed whitish subterminal triangles from the crown to the rump in *rufescens*). The general colour of the upperparts is distinctly more uniform and more rufous above in *thilohoffmanni* than in *rufescens* (in which most specimens are dark warm brown above, although a few have more rufous-brown upperparts, and thus are intermediate in colour between typical *rufescens* and *thilohoffmanni*). The scapular spots present in almost all species of scops-owls (at least as adults) are obsolete in *thilohoffmanni*, in which the scapulars are only slightly paler rufous than the surrounding feathers, and are similarly marked to the surrounding feathers (vs. rufous-buff but fairly distinct and heavily marked scapular spots in *rufescens*).

The wings of *thilohoffmanni* have a great deal of black proximally and on the inner webs (vs. rufous-brown in *rufescens*), and the wing banding of *thilohoffmanni* is comprised of even-width, rather weak rufous-buff bands alternating with narrowly dark-outlined rufous bands (vs. moderately to boldly, broad-banded dark brown and narrower buff wing-bands in *rufescens*). The undersurface of the outer primaries of *thilohoffmanni* is blackish except for the outer webs and tips, whilst the bases of the inner primaries are more boldly banded (vs. the entire undersurface of the remiges being rather boldly banded with broad dark and narrow pale bands in *rufescens*). The primary-coverts and alula are blackish except at their very tips, and are markedly and contrastingly different from the surrounding feathers in *thilohoffmanni* (vs. coloration and banding similar to the surrounding feathers in *rufescens*).

The throat of *thilohoffmanni* is weakly marked, mostly with fine dark barring and only extremely fine dark streaking (vs. distinctly dark-streaked in *rufescens*). The ground colour of the underparts of *thilohoffmanni* is a somewhat colder, less



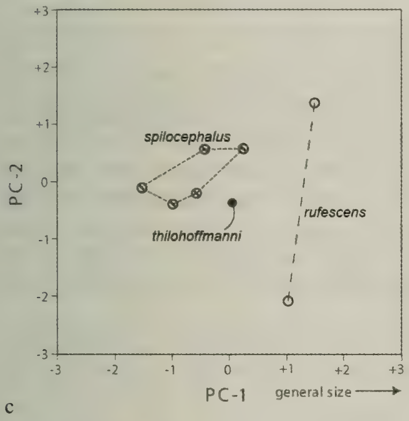


Fig. 2a–c. Graph of loadings for individual specimens from principal components analyses (PCAs) for (a) skin measurements for *Otus thilohoffmanni* and *O. rufescens* only; (b) skin measurements for *O. thilohoffmanni* and other related species; and (c) skeletal measurements for *O. thilohoffmanni* and two related species.

yellowish rufous than that of almost all specimens examined of *rufescens* (one specimen of *rufescens* had darker and browner underparts than the others, but these were still more ochraceous than *thilohoffmanni*). The feathers of the underparts of *thilohoffmanni* have very weak pale shaft-streaks (vs. usually fairly marked pale shaft-streaks in *rufescens*), and the dark subterminal spots of the underparts feathers are mostly shorter, less extensive proximally on the feather than in *rufescens* (which usually has large squared spots below, offset by slightly paler areas), with a stronger hint of a dark cross-bar near the tip. On the breast and lower throat some markings take the form of short bars or chevrons rather than spots.

The tail of *thilohoffmanni* is more rufous, with nearly equal-width dark and rufous bands (vs. dark brown in *rufescens* with narrow, widely spaced pale bars). The bases of the inner rectrices and most of the other rectrices of *thilohoffmanni* are largely black (vs. brown and like the rest of the tail in *rufescens*).

The tarsi of *thilohoffmanni* are less than half-feathered (vs. almost entirely feathered in *rufescens*). The podotheca (skin of the toes) of *thilohoffmanni* is smooth on its uppersurface, whilst that of *rufescens* is rougher and more heavily

TABLE 2

Results of factor analyses of external measurements of *O. thilohoffmanni* with (a) only *O. rufescens* (see Fig. 2a) and with (b) several other species (see Fig. 2b). Variable abbreviations as in Table 1.

	a			b	
Variable	PC 1 loadings	PC 2 loadings	PC 3 loadings	PC 1 loadings	PC 2 loadings
Culmen 1 from cere	-0.32	0.22	0.85	0.76	0.54
Maxillad at cere	-0.39	-0.78	0.46	0.74	0.34
Rictal bristle l	0.97	0.03	0.05	-0.75	0.62
Auricular l	0.83	-0.05	-0.02	---	---
Ear-tuft l	-0.65	0.70	0.06	0.77	0.26
Wing l	0.62	0.32	0.61	-0.47	0.8
Tail l	-0.12	0.95	-0.09	---	---
Tarsus l	0.65	0.23	0.11	---	---
Variance explained	3.15	2.19	1.35	2.50	1.59
Percent of variance explained	39.33	27.36	16.89	50.09	31.74
t-square for *thilohoffmanni*	6.86	---	---	0.09	---
Probability for *thilohoffmanni*	0.26	---	---	0.96	---

armoured. The general feather texture of *thilohoffmanni* is softer and fluffier (vs. stiffer and harsher in *rufescens*). In overall size and structure, *thilohoffmanni* is similar to *rufescens* (Table 1) but slightly smaller and more delicately built, with a longer wing, a longer but weaker tarsus, and a slightly longer digit 2 (the longest toe). In a principal components analysis (PCA) of external measures (Table 2a, Fig. 2a) in which only *thilohoffmanni* and *rufescens* were included, the two were separated on PC-1, which was primarily a contrast axis between longer facial bristles, wing length, and tarsus length vs. longer ear-tufts. PC-2 was significant but did not separate the two species, as specimens of *rufescens* showed wide variance on this axis. However, in a PCA that included external measures of several species of similar owls (Table 2b, Fig. 2b), *thilohoffmanni* was very similar both to continental *spilocephalus* and to *balli*, and separated only weakly from *alfredi* and *rufescens*. In this model, PC-1 was primarily a contrast axis between bill size and ear-tuft length vs. facial bristle length and wing length, and *thilohoffmanni* is essentially intermediate in these characters between *rufescens* vs. all the other included taxa.

In a PCA of skeletal measurements (Tables 3–4, Fig. 2c), *rufescens* is the largest species (though differences are slight), *spilocephalus* the smallest, and *thilohoffmanni* very like larger individuals of *spilocephalus*. Shape contrasts did not separate the species for the variables measured. Wing shape was measured as shortfalls of each primary from the longest primary in the folded wing (Fig. 3), and this showed that *thilohoffmanni* has a very similar wing shape to *rufescens*; the latter may have a slightly broader inner wing but the samples are too small to be certain. Based on a single specimen, *O. icterorhynchus* shows a similar wing shape to the above species. Members of the *O. magicus* superspecies (shown here are the Seychelles Scops-owl *O. insularis* and the Flores subspecies of Moluccan Scops-

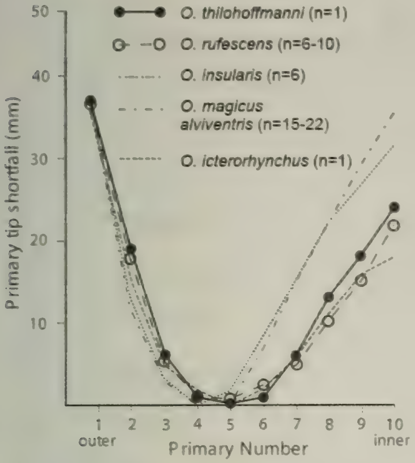


Fig. 3. Wing shape (as measured by shortfalls of each primary from folded wingtip) of type specimen of *Otus thilohoffmanni*, compared with *O. rufescens* and selected other species of scops-owls (mean values shown where n>1). Data for *O. insularis* and *O. magicus albiventris* are from Rasmussen (1998).

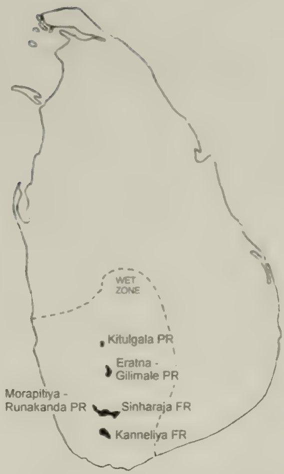


Fig. 4. Map of Sri Lanka, showing rainforest tracts from which *O. thilohoffmanni* has thus far been recorded. Dashed line shows inland limits of wet zone. Largest rainforest tract is divided into the western, smaller portion Morapitiya-Runakanda P.R. and the larger, more eastern portion Sinharaja F.R.

owl *O. magicus albiventris*) have markedly narrower inner wings (data for other taxa in Rasmussen 1998 and Lambert & Rasmussen 1998).

Distribution *Otus thilohoffmanni* is endemic to Sri Lanka. It has thus far been found only in lowland rainforests of the south-west quarter of the island within an altitudinal range of 30–530 m (Fig. 4). As of January 2004, the species had been detected in Kitulgala P.R. (06°59'N, 80°24'E, *c.*150 m a.s.l.), Sinharaja F.R. (06°25'N, 80°26'E, *c.*500 m a.s.l.), Morapitiya-Runakanda P.R. (06°29'N, 80°18'E, *c.*100 m a.s.l.), Kanneliya F.R. (06°11'N, 80°22'E, *c.*30 m a.s.l.) and Eratna-Gilimale P.R. (06°45'N, 80°26'E, *c.*100 m a.s.l.).

Description of the holotype (colours from Smithe 1975) Crown rounded, lacking differentiated ear-tufts, colour closest to Raw Sienna (136), each feather with several short, narrow Dark Grayish Brown (20) bars across centre. Forehead and supercilium Cinnamon (30) marked with similar short bars as for crown, the supercilium slightly paler than forehead. Circumorbital area and ear-coverts between Raw Sienna and Chestnut (32), with weak, narrow darker barring overall. Ear-covert feathers lack darker, compact distal ends (e.g. a well-formed facial disk border is lacking) and they also lack elongated feather shafts. Rictal bristles fairly long and abundant, and similar in colour to ear-coverts. Nape slightly paler than

TABLE 3

Skeletal measurements (in mm) of type specimen of *O. thilohoffmanni* and similar species.
L = length, h = height, w = width, d = depth.

Species	Preorbital roof w	Postorbital roof w	Preorbital rim h	Skull l (minus maxilla)	Max skull w	Max skull h	Supraorbital process w	Humerus l	Humerus distal w	Humerus head + deltoid crest w	Humerus head w/o deltoid crest w	Humerus shaft w	Femur l	Femur proximal w	Femur shaft w	Coracoid l	Coracoid shaft w	Procoracoid + head w	Scapular l	Scapular proximal w	Scapular shaft w
thilohoffmanni	8.2	12.5	3.9	30.3	33.3	21.1	15.3	44.1	7.6	8.2	7	2.9	29.6	5.3	2.3	19.7	1.9	3.3	24.1	4.5	1.5
rufescens	8.7	13.5	4.6	30.5	33.6	22.5	17.5	42.9	7.8	9.4	8.0	3.0	29.2	5.8	2.4	20.3	2.3	4.2	25.4	4.2	1.57
SD	0.85	0.99	0.42	0.14	1.63	0.64	2.62	1.13	0.28	1.2	0.28	0	1.56	0.57	0.07	0.2	0.21	0.42	0.49	0.42	0.11
(n)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
icterorhynchus	---	---	---	30.1	31.6	23.4	---	42.5	---	9.3	7.9	3.2	28.7	5.4	2.2	19.3	2.2	3.57	25.3	4.8	1.6
SD	---	---	---	---	---	---	---	---	---	0.81	0.14	---	1.44	0.14	0.07	0.78	0	0.21	0.15	0.07	0.07
(n)										(3)	(2)		(3)	(2)	(2)	(3)	(2)	(3)	(3)	(2)	(2)
spilocephalus	7.6	11.5	3.3	28.6	31.4	21.6	11.9	40.8	7.4	9.2	7.3	2.7	29.1	5.4	2.3	18.5	2.1	3.6	23.2	4.5	1.5
SD	0.72	0.97	0.19	0.78	0.98	0.86	1.34	0.93	0.25	0.22	0.40	0.13	0.75	0.18	0.15	1.01	0.11	0.16	0.84	0.18	0.0
(n)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)

TABLE 4

Results of factor analyses of skeletal measurements of *O. thilohoffmanni*, *O. rufescens* and *O. spilocephalus* (see Fig. 2c). Variable abbreviations as in Table 3.

Variable	PC 1 loadings	PC 2 loadings	PC 3 loadings
Preorbital roof w	0.80	-0.48	0.13
Postorbital roof w	0.81	-0.49	0.10
Preorbital rim h	0.84	-0.47	0.01
Skull l (w/o maxilla)	0.87	-0.25	0.37
Max skull w	0.88	0.27	0.32
Max skull h	0.84	0.31	-0.21
Supraorbital process w	0.85	-0.49	0.10
Humerus l	0.74	0.12	0.58
Humerus distal w	0.88	0.29	0.19
Humerus head + deltoid crest w	0.35	0.74	-0.53
Humerus head w/o deltoid crest w	0.91	0.19	-0.32
Femur l	0.51	0.73	0.35
Femur proximal w	0.67	0.62	-0.29
Femur shaft w	0.67	0.3	-0.28
Coracoid l	0.95	0.001	0.15
Coracoid shaft w	0.68	-0.39	-0.46
Procoracoid + head w	0.71	-0.48	-0.46
Scapular l	0.97	-0.02	0.05
Scapular proximal w	-0.25	0.78	0.33
Scapular shaft w	0.62	0.55	-0.13
Variance explained	11.66	4.20	1.93
Percent of variance explained	58.30	20.99	9.64
t-square for *thilohoffmanni*	5.45	---	---
Probability for *thilohoffmanni*	0.37	---	---

crown and similarly marked. Mantle same colour or slightly more rufescent than crown, the markings darker but more widely spaced. Lower back and rump have weaker, more closely spaced dark bars than mantle. Scapulars Cinnamon with weak, widely spaced dark bars, each with a stronger small dark subterminal mark; edges and tips of each scapular more rufous, closer to Tawny than Cinnamon. Secondary-coverts Antique Brown (37) with very fine pale shaft-streaks and tiny dark spots along the shaft; greater coverts close to Cinnamon with larger, blacker shaft-spots. Alula mottled Antique Brown and Cinnamon on outer webs and extreme tips, grading to Dusky Brown (19) on inner webs. Greater primary-coverts Dusky Brown except for Cinnamon on extreme tips. Outer webs and tips of primaries and secondaries moderately banded with even-width dark and pale bands of Raw Sienna bounded on both sides by narrow Dark Brownish Olive (129) bars, alternating with pale bands between Cinnamon and Buff; these grade on inner webs to Dusky Brown. Upper tail surface Raw Sienna, weakly and incompletely banded Dusky Brown, the bands stronger on outer webs of outer rectrices, the inner webs and basal portions of each rectrix predominantly Dusky Brown. Throat Cinnamon

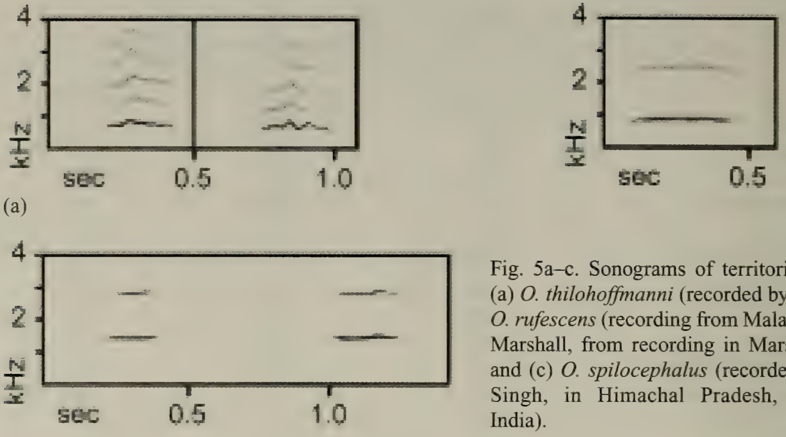


Fig. 5a–c. Sonograms of territorial songs of (a) *O. thilohoffmanni* (recorded by DHW), (b) *O. rufescens* (recording from Malaysia, by J. T. Marshall, from recording in Marshall 1978), and (c) *O. spilocephalus* (recorded by Pratap Singh, in Himachal Pradesh, north-west India).

with very fine, weak darker shaft-streaks. Breast between Tawny (38) and Cinnamon, with short, narrow, Dark Grayish Brown chevrons overall, larger and more triangular on lower breast. Flanks Cinnamon with triangular Dark Grayish Brown spots overall. Centre of belly between Buff (124) and Cinnamon, and essentially unmarked. Tarsal feathering covers less than half the tarsus and is unmarked Cinnamon, slightly darker on front of tarsus and paler, almost whitish, in rear and near distal edge of feathering. Bill wholly pale, laterally compressed, and not sharply curved, with a rather long hooked tip. Tarsi, toes and claws weak, slender, elongate, and entirely pale.

Specimens Only the holotype is known.

Measurements of the holotype (in mm) Total length (crown to tail tip) *c*.165, culmen (from cere) 12.9, wing 129, tail 63, tarsus 27.7 (see also Table 1).

Voice The song of *Otus thilohoffmanni* (Fig. 5a) is unobtrusive and easily overlooked. It is diagnostic to species when known but so simple in form and so infrequently delivered that it is easy to understand how the existence of the bird was overlooked until recently. In the forest the song has a ventriloquial quality. The female gives a short, piping, musical, tremulous note *pU'U'u* that rises slightly and falls again in pitch, identical notes being uttered in series but each note separated by a considerable pause (frequency of recording by DHW 0.65–0.8 kHz, note length 0.3 seconds, repeated after 15–29 seconds). The male gives a slightly lower pitched, slightly shorter, less tremulous version (frequency of recording by DHW

0.55–0.7 kHz, note length 0.2 seconds, repeated after 22–35 seconds).

Despite its unobtrusiveness, the song of *O. thilohoffmanni* is distinctive and diagnostic. It resembles that of *O. rufescens* (Fig. 5b) more than any other regional scops-owl species; however, the song of the latter is louder, longer, more piping, higher pitched, and less quavering, and the differences are consistent with treatment as separate species. The song of *O. spilocephalus* (Fig. 5c) is an oft-repeated pair of monotonous, short, more bell-like notes, whilst that of *O. alfredi* is still unknown (suggesting that its song must be inconspicuous or atypical for an owl).

Etymology We name the new owl in honour of Mr Thilo W. Hoffmann, who has for so long done much for nature conservation and ornithology in Sri Lanka. Mr Hoffmann was almost single-handedly responsible for saving from destruction the Sinharaja forest, where the owl was first observed.

We chose for the species the common name Serendib Scops-owl, which has already appeared informally in some other publications. 'Serendib' (also rendered 'Serendip') is an ancient name for Sri Lanka. It is the word from which 'Ceylon' and a variety of other words were derived, including the English word 'serendipity', which aptly describes the unexpected and happy discovery of this new owl.

Remarks

Habitat and ecology *Otus thilohoffmanni* has thus far been located only in larger tracts of lowland rainforest, at 30–530 m. All of the localities in which the bird has been observed so far have been disturbed areas with dense, tall secondary growth. The owl appears to be generally rare but common very locally at certain sites.

Otus thilohoffmanni is essentially a nocturnal forest bird of secretive habits. However, it usually commences vocalising at dusk, remaining at its roost until darkness falls. Then it starts flying around exploring for food in the vicinity, vocalising for some time while doing this. It nearly always roosts near the ground (sometimes as low as *c.*1 m), judging from the position of calls at dusk and one observation. The bird's coloration, size and shape camouflage it very well among clumps of drying or dry leaves, or dead fallen leaves, in dense undergrowth consisting of bamboo, viz. *Davidsea attenuata*, *Ochlandra stridula* and *Pseudoxythenanthera monadelpha*, tree ferns *Cyathea* spp., other ferns, creepers and other such vegetation, and it has been observed roosting in such a place. It keeps to cover at all times. From observations it appears that a pair maintains a territory year-round. Vocalisations are more frequent in localities with higher densities of the species. It appears from the distribution of vocalisation types heard and one direct observation that the male and female roost apart.

Our observations suggest that for about the first two hours after dark *O. thilohoffmanni* hunts for prey in the undergrowth. It has been seen capturing and consuming beetles and moths, and analysis of stomach contents of the type specimen revealed the partly digested legs, head and elytra of three beetles

TABLE 5

Qualitative osteological characters of type specimen of *O. thilohoffmanni* and other *Otus* species. L = length, w = width, h = height. Species/species groups that share characters with or are very similar to *thilohoffmanni* indicated in boldface type.

		Characters													
Species	n	Interorbital roof w (anterior vs. posterior)	Supra-orbital process l	Post-orbital process w	Post-orbital process direction	Temporal groove bridge	Lateral production of external rim of otic capsule vs. postorbital process	Angle of otic capsule external vs. internal rims	Cranial flange of otic capsule	Lateral rim of preorbital	Humerus shaft distal expansion (relative to rest of shaft)	Bicipital crest lateral expansion	Coracoid	Scapula	Sternal keel h
thilohoffmanni	1 partial	**much narrower**	**inter-mediate**	**very broad**	**much more caudally**	**unbridged**	**less produced**	**angle very shallow**	**much thinner**	**moderately inflated**	**very slightly expanded**	**little expanded**	**very slender**	**very slender**	**weakest, shallowest**
rufescens	2	**much narrower**	**rather long, spiky**	**very broad**	**somewhat more caudally**	nearly to very narrowly bridged	**less produced**	**angle shallow**	**much thinner**	**most inflated**	**slightly expanded**	**little expanded**	**fairly slender**	**very slender**	**weak, shallow**
spilocephalus	5	**much narrower**	small	fairly broad	**somewhat more caudally**	nearly to very narrowly bridged	**less produced**	**angle shallow**	**much thinner**	**moderately inflated**	**slightly expanded**	**little expanded**	**fairly slender**	**very slender**	**weakest, shallowest**
bakkamoena sensu lato	several	**much narrower**	very long, spiky (usually)	fairly broad	slightly more anteriorly	nearly to broadly bridged	more produced	**angle shallow**	**thin, somewhat variable**	**moderately inflated**	moderately expanded	**little** to moderately **expanded**	**fairly slender**	somewhat thicker	slightly to much deeper
icterorhynchus	1 full, 2 partial	**much narrower**	small	much less broad	more anteriorly	**unbridged**	more produced	angle very deep	---	**inflated**	moderately expanded	moderately expanded	heavier	fairly slender	moderately deep
scops	several	equal-width	small	much less broad	more anteriorly	broadly bridged	much more produced	angle moderate to deep	thick	not inflated	moderately expanded	moderately expanded	**fairly slender**	slightly thicker	moderately deep
rutilus	4	equal-width	small	much less broad	---	narrowly bridged	more produced	angle deep	thick	**inflated**	expanded	moderately expanded	heavier	---	---
insularis	1 partial	equal-width	---	---	---	---	more produced	angle deep	thick	not inflated	---	---	heavier	---	shallow
flammeolus	several	equal-width	small	much less broad	much more anteriorly	very broadly bridged	much more produced	angle shallow	thick	not inflated	moderately expanded	**little expanded**	heavier	very slender	relatively very deep
Megascops spp.	several spp.	equal-width	small	less broad	slightly to distinctly more anteriorly	moderately to broadly bridged	much more produced	angle moderate to deep	thick	slightly inflated	broadly expanded	moderately to broadly expanded	**fairly slender** to heavier	slightly to distinctly thicker	robust, very deep

(Scarabaeidae), which had been consumed on the night of capture. The species is able to exploit this feeding niche of the forest during this time, as it then has no nocturnal bird as a competitor. The sympatric nocturnal Ceylon Frogmouth *Batrachostomus moniliger*, which hunts the same food, roosts as low but flies to higher levels to feed. The sympatric, partially diurnal, endemic Chestnut-backed Owlet *Glaucidium castanonotum* hunts at low levels in daylight and higher levels nocturnally. Both these species probably become the new owl's competitors later in the night, when it begins to explore higher levels for the same prey.

When *O. thilohoffmanni* hunts in the undergrowth it often perches easily on thin angled and vertical twigs and stems of plants, the most readily available perches at this level. The small, weak legs and toes may be an adaptation for this light-bodied bird to use such perches. After feeding at this level it usually flies somewhat higher to rest, sometimes for a prolonged period, on a branch that is horizontal or nearly so. When resting it often assumes a 'relaxed' position, which is a rather hunched posture with eyes partially closed and feathers somewhat fluffed. After resting it resumes feeding, now at a higher level, between the undergrowth and subcanopy. Its vocal activity peaks again during the last two hours before dawn.

In rainforests of the wet zone *O. thilohoffmanni* replaces the Indian Scops-owl *O. bakkamoena*. The latter avoids wet forests and occurs in wooded habitats outside these, even around human dwellings. Compared with the two forest species mentioned above, other nocturnal birds occurring sympatrically with *O. thilohoffmanni* are rare in this habitat. These are: Bay Owl *Phodilus badius assimilis*, Forest Eagle-owl *Bubo nipalensis*, Brown Fish-owl *Bubo zeylonensis*, Brown Wood-owl *Strix leptogrammica*, Brown Hawk-owl *Ninox scutulata* and Jungle Nightjar *Caprimulgus indicus*. Amongst these the Bay Owl also exploits the same levels of forest vegetation and may be encountered hunting for the same prey, but its diet is broader, and the species appears to be much rarer. Brown Hawk-owl is another possible competitor, but it is quite local and rare in Sri Lankan rainforests, and it is sympatric to a much greater degree with the Indian Scops-owl. The other three owls seek larger prey, and the nightjar explores the high canopy in its brief hunting forays to the forest.

Systematic relationships Although *Otus thilohoffmanni* lacks ear-tufts, we initially believed it to be a member of the genus *Otus* (*sensu lato*) based on its general appearance and obvious resemblance to *O. rufescens*. Nevertheless, we could not readily detect external characters diagnostic of the large, highly variable genus *Otus*, even when restricted to the Old World members, now recognised as generically distinct from most New World members, which have been separated by recent authorities as *Megascops*. However, we were able to confirm the allocation of *O. thilohoffmanni* to the subfamily Striginae (which contains mainly the ear-tufted genera *Otus* and *Bubo* and their close relatives, and the non-tufted *Strix*) as opposed to the Surniinae (in which most non-tufted owls fall, including, among small owls, the genera *Glaucidium*, *Athene*, and *Ninox*) by the lack of a triangular dorsal process on the jugal bar. Presence or absence of this process is considered diagnostic to subfamily within the Strigidae (Ford 1967), and observations during our study are consistent with Ford's conclusions regarding this osteological character.

Although *O. rufescens* seems to be the most similar species to *thilohoffmanni* in external appearance, numerous differences exist that suggested the relationship might not be particularly close or the resemblances might even be convergent. These include the very different upperparts pattern, the different facial disk structure, and major differences in ear-tuft development, bill shape, and tarsal and foot characteristics. *Otus spilocephalus*, despite its many plumage differences even in the extreme rufous morph, is however more similar in certain external structural characters to *thilohoffmanni* than is *rufescens*, such as the pattern of the upperparts, its soft plumage and well-developed facial bristles, its weak, unarmoured toes, a similar wing-banding pattern, and its tendency to have blackish bases to the flight feathers (but much less markedly so than in *thilohoffmanni*).

Osteological comparisons (Table 5) further confirmed the correct generic placement of *O. thilohoffmanni*. Further study is needed of more material to enable reconstruction of the phylogenetic relationships of *thilohoffmanni*, but based on overall similarity and lack of significant differences, we are now confident that it is indeed closely related to *rufescens*, and may be its sister species. However, most of these osteological similarities are also shared with *O. spilocephalus* (and probably with other similar taxa for which skeletal specimens are not available, such as *O. balli* and *O. alfredi*), and in external and skeletal proportions, *thilohoffmanni* is more like these taxa than any are to *rufescens*. All other groups of scops-owls (for which skeletons were available) differ in several osteological characters from *thilohoffmanni*, *rufescens* and *spilocephalus*. Thus the question of the sister taxon to *thilohoffmanni* may not be resolvable until DNA-based phylogenetic analyses can be carried out. We are planning such studies but are greatly hampered in this by the lack of material for most of the related taxa and the scarcity of museum specimens, especially recent ones. We can, however, state with confidence that *O. thilohoffmanni* is one of the more distinctive bird species endemic to Sri Lanka, and that it must have had a fairly long separate evolutionary history on the island.

The juvenile (mesoptile) plumage of *O. thilohoffmanni* remains unknown. That of *O. rufescens* (based on an NNM specimen) is almost uniform rich rufescent brown, with a weakly defined dark facial disk rim, and very vague, almost obsolete dark barring, strongest on the hindcrown and upper mantle. However, the juvenile (mesoptile) plumage of rufous-morph continental races of *spilocephalus* is more heavily but still vaguely barred dark and pale over its generally rufous downy plumage. Thus, the juvenile of *rufescens* resembles the adult of *thilohoffmanni* even more strongly than does the adult (except for the downy texture of its plumage), and the juvenile plumage of *thilohoffmanni* may well be similar to that of one of these species.

Conservation As of January 2004 *c*.45 individuals of *Otus thilohoffmanni* are known from the five sites listed above, each of which is one of Sri Lanka's few large remaining rainforests. Each is a protected area administered as a Forest Reserve (F.R.) or Proposed Reserve (P.R.) by the Forest Department of Sri Lanka. The species apparently requires a large, fairly intact area of rainforest of a certain size and richness, yet to be quantified and accurately described. It has not been found in rainforests smaller than 8.2 km^2 in extent. A number of such remnant patches are scattered in the wet zone, and several of these were unsuccessfully surveyed by DHW and colleagues. Of the forests where the species is so far known to occur, its strongholds are the Sinharaja and Morapitiya-Runakanda reserves, which are contiguous and may be considered as effectively one tract.

We believe there are more individuals of *O. thilohoffmanni* living in these five forests than the 45 detected so far. However, from the data gathered the species occupies a quite restricted range within Sri Lanka. The total extent of these five forests is *c*.230 km^2. This can be considered the extent of occurrence of the species as known so far. The initial survey has now investigated *c*.60% of wet-zone forests out of a total area of such forests estimated at *c*.2,200 km^2 in 1995 (Legg & Jewell 1995). Based on present knowledge we would therefore propose for *O. thilohoffmanni* the IUCN Red List Category 'Endangered' (EN), as it meets criteria B.1.a, B.1.b, B.2.a and B.2.b (and possibly also C.2.a and D) (IUCN 2001).

It has long been believed that the composition of the avifauna of Sri Lanka is well known compared to that of other Asian countries. In 1951 W. W. A. Phillips, one of the foremost authorities on the island's avifauna and a resident of Sri Lanka for three decades, stated that it was 'most improbable that a bird entirely new to science could now exist in Ceylon' (as the country was known then) (Spittel 1951). Indeed, very few bird species new to science have been discovered anywhere in South Asia in the past few decades; the others are the morphologically cryptic Nepal Wren-babbler *Pnoepyga immaculata*, which had previously been collected but not recognised as distinct until its vocalisations were studied (Martens & Eck 1991); the enigmatic Sillem's Mountain-finch *Leucosticte sillemi*, still known only from two specimens collected in 1929 and not recognised as distinct for many years (Roselaar 1992); and the Nicobar Scops-owl *Otus alius*, which was first collected in 1966 but misidentified as *O. sunia*, then attributed to (but not formally described as) a race of the widespread *O. magicus*, until it was recognised and described as a full species (Rasmussen 1998). Thus, *Otus thilohoffmanni* is unique among the birds of South Asia in having been totally overlooked by collectors and other field naturalists alike until its discovery by DHW on the basis of its unfamiliar vocalisations.

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APPENDIX

Methods developed during this study for mist-netting and viewing small owls.

Movable mist-net method. On 4 August 2001 DHW, Kithsiri Gunawardena and Chandima Kahandawala attempted to capture an individual of *O. thilohoffmanni* at Morapitiya-Runakanda P.R using mist-nets in the standard manner. Several nets were drawn across posts struck in the ground. They were laid to intercept the bird when flying in different directions within a part of its territory. Each set of nets (across each pair of posts) covered a height of *c*.1.5–8 m. The owl was coaxed into these by playback of the species' vocalisation. In several attempts the bird was seen first on one side of a net and soon after on the other, somehow evading it.

It was then suggested by Chandima Kahandawala that mist-nets to cover the same height range be set up across two posts not embedded in the ground but each steadied by one person, and the system moved towards the owl sideways along a path while listening to it in the dark (when the bird responded to playback). This method soon proved successful.

It was difficult to move the heavy posts used on that occasion and maintain tautness in the nets to prevent their loops around the poles from slipping, while staying silent in darkness. A pair of stiff and strong but light posts in several sections that can be assembled quickly was designed and constructed by Niran Caldera. The height of the nets can be varied before or after the system is set up. The loops engage small projections on the posts. Whilst they do not slide down when the posts are slightly slackened on the move, a net can be lowered quickly by prising the loops off with a light, suitably shaped rod. This system was used on 9 November 2002 at Morapitiya-Runakanda P.R. in taking the type specimen and brought success easily. We believe this method will be useful for researchers attempting to capture small owls and other related nightbirds in the dark.

Rim method of lighting. Artificial light is essential for nocturnal observations in studying the behaviour of *O. thilohoffmanni*. In the initial stages of the project it appeared that the bird was discomfited when the brighter centre of the beam of light was directed toward its face for more than several seconds. To avoid this problem, DHW and colleagues began to aim the beam slightly away so that a less bright outer circle of light fell on the bird for prolonged viewing. They observed that the bird then exhibited no discomfort. This was indicated by it reverting to its normal behaviour in chasing after and feeding on insects, flying about normally and perching in its 'relaxed pose' after feeding well. The same response was seen in other nocturnal birds observed in forests during the project. We found that the use of artificial light in this manner does not greatly disturb the normal nocturnal activities of nightbirds.

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First confirmed record of Oilbird *Steatornis caripensis* for Brazil

by Andrew Whittaker, Axel H. Antoine-Feill S. & Robin Scheiele Z.

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The Oilbird *Steatornis caripensis* is a rather unusual New World Caprimulgiform and is unique in being the only nocturnal avian frugivore in the world. It occurs locally in montane northern Venezuela, and in the Andes from western Venezuela to western Bolivia, together with the tepuis of southern Venezuela, eastern Colombia, Guyana and Trinidad (Ridgely & Greenfield 2001).

Oilbirds are gregarious, with colonies occupying large dark caves, which are used both as daytime roosts and for breeding. They depart the caves at dusk, flying long distances to forage gregariously for fruit, apparently locating aromatic fruit by smell and non-aromatic fruits such as palms by sight (Snow 1962). Recent genetic analysis of Caprimulgiformes indicates that Oilbirds were the earliest to branch away from all lineages (Brumfield *et al.* 1997), with the species' closest affinities thought to be with Nyctibiidae (potoos) and Caprimulgidae (nightjars). The distinct rufous plumage and bold white spotting of the Oilbird cause it to resemble superficially the much smaller Rufous Potoo *Nyctibius bracteatus*.

On 21 May 1998 at Palmari Lodge, rio Javari, Amazonas (04°17'S, 70°17'W) the freshly dead remains of an Oilbird were found by A. Antoine-Feill S. and R. Scheiele Z., along a forest trail through virgin *terra firme*. Feather samples were collected and five feathers, a primary, two secondaries, one rectrix and a mantle feather, were deposited in the Instituto Nacional de Pesquisa da Amazonia, Manaus (INPA 447) as material evidence for this, the first confirmed Brazilian record. AW made a direct comparison of the Palmari feathers with two Venezuelan specimens at the Museu Emílio Goeldi in Belém (MPEG 33147–48) from the río Paragua, Cerro Urutaní, Bolívar. This confirmed beyond doubt that the feathers belonged to an Oilbird.

Following the discovery at Palmari, communication with local inhabitants revealed that they not only knew of the presence locally of Oilbirds, they also described the birds' plumage, habits and characteristic screaming calls. Furthermore, they informed how Oilbirds are sometimes killed on river cliffs or hollow trees, as they roost by day, later being used as torches by the community as they burn well for long periods. Historically, nestlings were collected by indigenous peoples and cooked to extract a clear, odourless oil that was used mostly for cooking or in some localities for lighting (del Hoyo *et al.* 1999).

From adjacent Peru, D. Graham (pers. comm.) has reported a recent observation of a lone Oilbird. At 2100 h on 1 January 2002 at Paucarillo Forest Reserve, Loreto (03°41'S, 72°11'W), along the río Orosa, DG and eight other ornithologists observed an Oilbird at close quarters. The bird was observed in flight by means of a strong spotlight beam in which it became disoriented, whereupon it flew towards the light and started to emit strong clicking sounds while it briefly flew in tight circles. The bird remained in the beam, 10–15 m above the riverbank, for *c*.45 seconds before flying strongly away. This Amazonian locality is *c*.225 km west-northwest from Palmari and on the south bank of the Amazon.

Sick (1984) was the first to report the possibility of Oilbird penetrating Brazilian territory, from occupied caves he located in 1970, in southern Venezuela close to the Brazilian frontier. During the mid 1980s, several colonies were discovered in the Venezuelan state of Bolívar, including a huge colony at Aguapira with as many as 10,000 birds. Sick (1993) included Oilbird as occurring in northern Brazil, in Roraima, because the Cerro Urutaní has been known to hold an active Oilbird colony since 1978. The cave entrance is 228 m from Brazilian territory (Dickerman & Phelps 1982). However, no sight or specimen records were available confirming the occurrence of Oilbirds in Brazil. Given this, it was highly likely that the species would be confirmed from northern Brazil, most probably from the highlands of Roraima. It was surprising, therefore, to have discovered it in the lowlands of western Amazonian Brazil.

The recent Amazonian lowland records from Brazil and Peru, in May and January, together with the comments of the local community around Palmari, strongly suggest that these occurrences in the lowlands may not refer to transitory individuals and that the species may prove be more widespread in Amazonia.

The nearest known breeding colony to Palmari in Colombia is *c*.600 km to the north-northwest in the tablelands of Vaupés (Olivares 1964, Hilty & Brown 1986). Colonies in Peru (T. Schulenberg pers. comm.) are mostly from Andean foothills 800–900 km away, but a recent record from Tahuayo (08°01'S, 74°02'W), *c*.600 km distant, is the closest record, east across the río Ucayali. Roca (1994), using radio telemetry in Venezuela on ten Oilbirds, recorded the maximum nocturnal foraging range as 150 km, although one bird moved 240 km in a single night to another roosting cave, demonstrating that the species can cover long distances quickly. It has also been recorded as a vagrant from Tobago, Panama and Costa Rica (Cleere 1998).

We suggest that further field work in western Amazonian Brazil and adjacent Peru should aim to locate Oilbirds and confirm their status. This might reveal whether the records reported here involved an unknown lowland colony. If a breeding population does exist, we strongly recommend that new specimens and tissue samples be collected, and a thorough comparison of these materials be made with highland birds in order to evaluate whether these birds represent a new taxon.

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Rapid speciation by a Lesser Antillean endemic, Barbados Bullfinch *Loxigilla barbadensis*

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The small endemic West Indian emberizine known as the Lesser Antillean Bullfinch *Loxigilla noctis* is widespread in the Leeward and Windward Lesser Antilles (Fig. 1). It has usually been regarded as highly polytypic and nine subspecies are currently recognised (Table 1). With one exception, all are strongly sexually dichromatic: males are jet black with rufous throats, rufous or black undertail-coverts, and black bills; females are brownish-olive, paler ventrally, with horn-coloured bills.

The exception is the population found only on the isolated and geologically discrete island of Barbados. Originally described by Cory (1886) as a separate species, Barbados Bullfinch *Loxigilla barbadensis*, nearly all subsequent workers, hewing to 20th-century taxonomic practice, have treated it as another subspecies of the Lesser Antillean Bullfinch, its scientific name then becoming *Loxigilla noctis barbadensis*. However, the bullfinches resident on Barbados differ in one striking way from the other eight named populations of the Lesser Antillean Bullfinch: they exhibit no sexual dichromatism. In the light of recent treatments of other allopatric West Indian bird populations, reconsideration of the taxonomic status of *barbadensis* is warranted.

Background

Until the mid 1980s, essentially the only examinations of Lesser Antillean Bullfinch's biology concerned its taxonomy (Hellmayr 1938, Bond 1956). Then, Bird (1983) compared the behaviour and ecology of *barbadensis* with that of several other Lesser Antillean Bullfinches, especially St Lucia's *sclateri* and St Vincent's *crissalis*, the two geographically closest to *barbadensis*. Regrettably, no portion of that thesis has ever been published and, despite intense efforts, we have been unable to contact its author. It nonetheless remains a seminal work bearing on the taxonomic status of *barbadensis*.

Equally important information concerns the geological history and age of Barbados. Here, too, the picture has now been clarified, and Barbados's striking geological history and youth, especially its relationship to islands in the main Lesser Antillean arc, are now well understood. The third piece of the puzzle finally fell into place with publication of a recent analysis of the molecular genetics of Barbados's breeding landbirds, including *barbadensis*.

Geology, vegetative cover and climate

Barbados is unique among the Lesser Antilles in being both very young and lacking any history of volcanism. It is also 150 km east of the main Windward Island chain, well out in the trade winds. Owing to its geological origins, it is relatively low in relief, its highest point, Mt Hillaby, reaching only 335 m, with about two-thirds of the island ranging from sea level to *c*.100 m, and almost another third to *c*.200 m.

Whereas basal rocks in north-eastern Barbados have been dated to the Upper Eocene/Tertiary (50–70 My BP), these are crustal rocks pushed up as a tectonic mound along the Barbados Ridge. This feature originated (and is still rising) as the South American Plate slid west-northwestward under the Caribbean Plate, in the process heating crust that emerged as lava from volcanoes on the Lesser Antillean Ridge from Grenada to Saba, along the main Lesser Antillean arc. These present-day islands first appeared in the Miocene, 15–30 My BP, and are still rising (Speed 1988, Perfit & Williams 1989, Speed & Keller 1993). Their volcanic soils were doubtless vegetated quickly, so they would have had a long history of avian colonisation and evolution.

'Proto-Barbados' on the other hand only emerged in fits and starts at the end of the Pleistocene, *c*.700,000–1 My BP, and for much of its early history was a combination of coral reefs and low-lying small islands, periodically eroded, submerged and rebuilt in response to sea-level changes, oceanic and rainwater erosion, and sedimentation. On average, it has been rising *c*.0.3 m per 1,000 years. The best evidence (Mesolella 1967) suggests that the core of present-day Barbados emerged 600–700,000 y BP. Originally a circular dome (the centre of the uplift), perhaps two-thirds of this original island subsequently eroded away; then *c*.300,000 y BP, a new island arose to its south-west (near present-day Bridgetown), eventually fusing via crustal uplift with the now much smaller main island.

Forest vegetation was probably slow to accumulate in such a low-relief, dynamic environment, and though there are as yet no known dates for establishment, forests most probably followed on the merging of Proto-Barbados and Christ Church islands, i.e. up to 300,000 y BP. Limestone soil generated by erosion (and, eventually, plant growth) was augmented by episodic infusions of volcanic ash from neighbouring St Lucia and St Vincent (e.g. an estimated 3.25 million tonnes [76 tonnes/ha] fell on Barbados following the irruption of St Vincent's Soufrière Volcano in 1901: Gooding 1974). Many plants probably colonised Barbados from the south (but not the north or west) via ocean currents such as the Antilles Current, fed by waters draining the Amazon and Orinoco Rivers and even western Africa. Winds doubtless also brought plant propagules from South America (*Urania* moths still regularly arrive on Barbados with southerly winds, as do vagrant and colonising birds), from West Africa, the source of airborne sediments as well as Desert Locusts *Schistocerca gregaria* (Prospero 1968, Rainey 1989, Savoie *et al.* 1989), and also from the Lesser Antilles north of Barbados. Birds might still be contributing plant material and seeds from North America, the West Indies and South America in soil on their feet and in their excreta. One analysis (Gooding 1974) estimated that of 478 extant, non-introduced, higher plant species on Barbados, 12% came from the north, 19% came from northern South America, 43% occurred throughout the Caribbean/tropical continental America, and 26% were pantropical; only five (1%) were Barbados endemics.

By the time of European colonisation in the early 1600s, Barbados was covered in forest, but unlike the volcanic Antillean-arc forests, it was not tropical rain forest, nor was it widespread. The high centre of the island, with good soil and 2,030 mm per year of rainfall, did support a rich mesic tropical hardwood woodland, whilst lower and drier elevations averaging 1,520 mm per year and sea coasts with only 1,015 mm per year grew only poorer hardwood and dry scrub forests, respectively. Especially on the windward side of Barbados, woody vegetation was conspicuously stunted and wind-shaped by salt spray.

Although persistent east–north-easterly trade winds blow at 15–30 kph most of the year, Barbados's low relief has eliminated most orographic precipitation, so the island is relatively dry: its mean annual rainfall of 520 mm is only about half that of St Lucia, whose tall mountains (nine in excess of 610 m, the highest 950 m) and strikingly vertical, montane topography (10% of St Lucia lies above 365 m) extract much more moisture from trade winds. Accordingly, St Lucia's tall, lush, and highly diverse tropical rain forests and elfin woodlands are wholly lacking on Barbados. This is reflected in endemic avian species: Barbados currently has but one (a few others were probably extirpated shortly after European colonisation: Hutt *et al.* in press), whilst St Lucia has three (perhaps four), including two endemic genera (Keith 1997).

Geographic variation within Lesser Antillean Bullfinches

Nine subspecies of *Loxigilla noctis* have been described (Table 1), many on only minor differences in colour, patterning or (not shown) measurements. All but one

TABLE 1
Subspecies of Lesser Antillean Bullfinch *Loxigilla noctis* (from north to south), their occurrence, and their male coloration (from Ridgway 1901)

Islands	Taxon	Male plumage
Anguilla, St Martin, St Barthélémy, Barbuda, Antigua	*ridgwayi*	head and upper breast matte black, fading to ashy black on rump, belly and tail; rufous-chestnut supraloral spot, chin, throat and undertail-coverts; black bill
Saba, St Eustatius, St Kitts, Nevis, Montserrat	*coryi*	jet black, with rufous-chestnut supraloral spot, chin, throat and undertail-coverts, black bill
Guadeloupe, Îles des Saintes, Marie-Galante, Dominica	*dominicana*	jet black, with rufous-chestnut supraloral spot, chin, throat and undertail-coverts, black bill
Désirade	*desiradensis*	head and upper breast matte black, fading to ashy black on rump, belly and tail; rufous-chestnut supraloral spot, chin, throat and undertail-coverts; black bill
Martinique	*noctis*	jet black, with rufous-chestnut supraloral spot, chin and throat, black undertail-coverts, black bill
St Lucia	*sclateri*	jet black, with rufous-chestnut supraloral spot, chin and throat, black undertail-coverts, black bill
Barbados	*barbadensis*	as female: brownish olive dorsally, grey ventrally, with orange-rufous undertail-coverts, dusky-horn bill
St Vincent	*crissalis*	jet black, with rufous-chestnut supraloral spot, chin, throat and undertail-coverts, black bill
Grenada	*grenadensis*	jet black, with rufous-chestnut supraloral spot, chin, throat and undertail-coverts, black bill

are strongly sexually dichromatic: black-billed males are jet black (or, on shrubby, xeric islands, black fading to ashy black posteriorly), with rufous-chestnut supraloral spots, chins, throats and undertail-coverts (Fig. 1). Two taxa have wholly black undertail-coverts, and individuals in a few others sometimes show black feathers intermingled with rufous. Females vary in more subtle ways through the Lesser Antilles and not always concordantly with males.

This local differentiation indicates that the Lesser Antillean Bullfinch is morphologically labile, probably in response to environmental conditions. Such eco-typical adaptation in plumage colour is hardly unknown in birds, so its appearance in the West Indies is unsurprising, even if its manifestation on islands only 10 km apart might be (jet black *dominicana* on Guadeloupe vs. ashy-black *desiradensis* on Désirade). Analysis of similar inter-island variation in Darwin's Finches (Geospizinae; Grant 1986) suggests that Lesser Antillean Bullfinch variation probably has a genetic basis. However variable, all Lesser Antillean Bullfinch populations still maintain strong sexual dichromatism—except *barbadensis* (Fig. 2), which has uniquely become sexually monochromatic, males and females

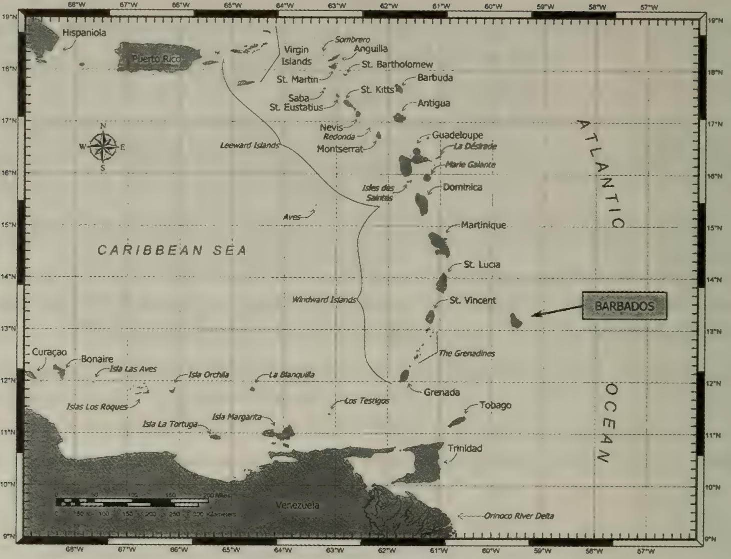
Hispaniola
Puerto Rico
Virgin Islands
Sombrero
Anguilla
St. Bartholomew
St. Martin
Barbuda
Saba
St. Eustatius
St. Kitts
Antigua
Nevis
Redonda
Montserrat
Leeward Islands
Guadeloupe
La Désirade
Marie Galante
Isles des Saintes
Dominica
Aves
Martinique
CARIBBEAN SEA
ATLANTIC
St. Lucia
Windward Islands
St. Vincent
BARBADOS
Curaçao
Bonaire
Isla Las Aves
Isla Orchila
La Blanquilla
The Grenadines
Grenada
Islas Los Roques
Los Testigos
Tobago
Isla Margarita
Isla La Tortuga
OCEAN
Trinidad
Venezuela
Orinoco River Delta
N
S
E
W

Figure 1. The West Indies, indicating all islands supporting forms of Lesser Antillean Bullfinch *Loxigilla noctis*, *sensu lato*, discussed in this paper.

resembling females of all other populations, a condition also called 'hen-feathering' (Mayr 1942).

In addition, we were immediately struck by how different Lesser Antillean Bullfinches were on Barbados and St Lucia, hen-feathering aside. Where *sclateri* is a solitary, generally shy, usually within-vegetation forager, *barbadensis* is a bold, open-country and woodland, ground-feeder that often occurs in small feeding groups with Black-faced Grassquits *Tiaris bicolor*, especially during the dry season.

The question immediately posing itself is whether morphological, ecological and behavioural changes in *barbadensis* have been accompanied by changes in its biological-species status, because we suspect that this unique switch from sexual dichromatism to sexual monochromatism was a profound, not trivial, evolutionary step.

Results

Ecology and behaviour of Barbados and St Lucia bullfinches

Bird (1983) questioned whether the change in morphology in *barbadensis* was attended by parallel behavioural and ecological changes and, if so, how these might be explained in terms of selective pressures and evolutionary history. Although she was not especially concerned with taxonomy, her results nonetheless have taxonomic implications. She compared *barbadensis* to its nearest geographic (and

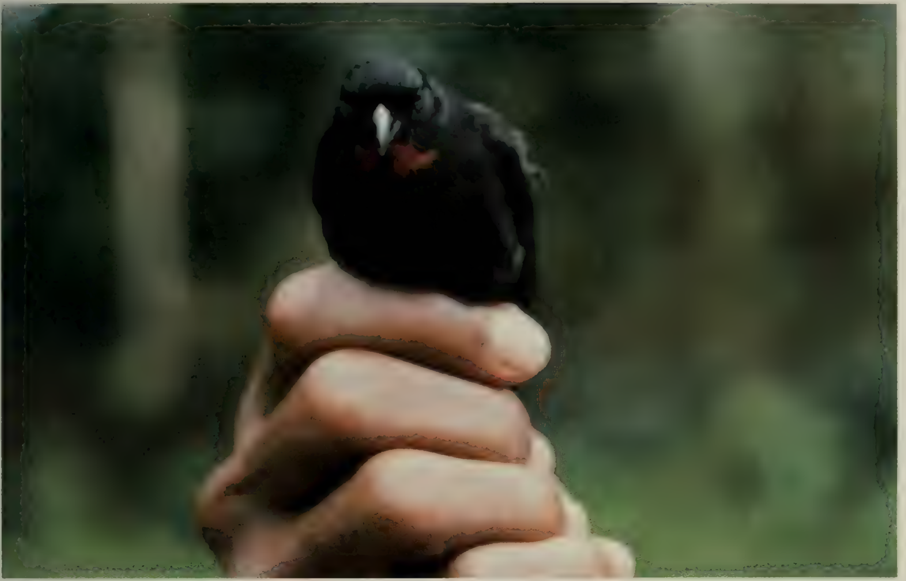

Figure 2. Male Lesser Antillean Bullfinch *Loxigilla noctis sclateri* from St Lucia, Lesser Antilles (Wayne Arendt)

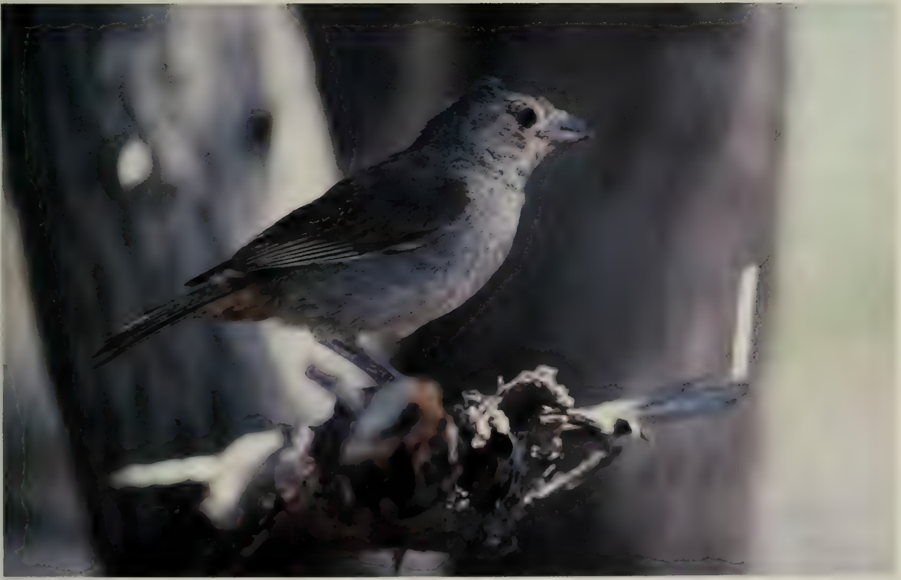

Figure 3. Male Barbados Bullfinch *Loxigilla barbadensis* (P. A. Buckley)

TABLE 2

Ecological and morphological comparison of the resident forms of 'Lesser Antillean Bullfinch' on Barbados (*barbadensis*) and St. Lucia (*sclateri*); data adapted from Bird (1983) and Ridgway (1901). All quantitative differences mentioned are statistically significant; see text and (Bird 1983) for additional information.

Character	*barbadensis*	*sclateri*
Male plumage	brownish olive dorsally, grey ventrally with orange-rufous undertail-coverts; dusky-horn lower mandible	jet black with rufous-chestnut throat and pre-orbital spot; bill glossy black
Female plumage	brownish olive dorsally, grey ventrally with orangish undertail-coverts; pale horn lower mandible	brownish olive dorsally, grey ventrally with orangish undertail-coverts; pale horn lower mandible
Diet		
fruit	10%	32%
flowers	29%	40%
seeds	36%	10%
insects	20%	8%
Foraging behaviour		
pecking	59.5%	45.5%
insect gleaning	13.0%	7.5%
foot-holding	11.0%	27.5%
flower-base chewing	10.0%	4.0%
nectar-feeding	4.5%	14.5%
ground-feeding frequency	50%	2%
foraging between 1–12 m	49%	92%
modal foraging height	0 m	4-5 m
mean foraging height	2.4 m	6.6 m
Breeding biology		
male nest-building effort (as % of female's)	114.0	60.5
mean incubation bout length	25.7 min	56.6 min
mean non-incubation interval	6.9 min	14.6 min
mean times male feeds incubating female	9.0	3.7
male nestling feeding trips/hr	1.5	1.1
female nestling feeding trips/hr	1.7	1.0
mean time male at nest/feeding trip	38.5 sec	77.4 sec
mean time female at nest/feeding trip	58.6 sec	101.7 sec
response to nest predators	attack, vocalise	flee, remain silent
advertising/courtship displays/vocalisations	undescribed	undescribed
time males spent within 3 m of nest during AM:		
nest building	22–30%	4–6%
incubation	28–46%	4–6%
brood rearing	14–22%	4%

mean intruder chases by males/2-hr period during:		
nest building	8.0	2.0
incubation	16.0	1.7
brood-rearing	13.7	2.0
mean number of male 'songs'/2-hour period during:		
nest building	9.7	3.3
incubation	14.0	1.0
brood rearing	7.0	2.0

dichromatic) neighbours, St Lucia's *sclateri* and St Vincent's *crissalis*, seeking insight into the geographic source of Barbados birds. Because we now know that *barbadensis* colonisers came from St Lucia and not St Vincent (see below), for the purposes of this paper we will only compare her findings for *sclateri* and *barbadensis* (in Table 2); readers are referred to Bird (1983) for additional information. All quantitative comparisons discussed here were statistically significant (P = 0.05).

DIET

Proportional diet composition differed strikingly between the islands. Seeds obtained on the ground and from flower heads accounted for 65% of *barbadensis*'s diet, but nearly that same fraction of *sclateri*'s came from fruit and flowers. Conversely, *barbadensis* consumed only *c.*10% fruit, *sclateri* only 8% seeds. (Diet composition as a function of food-type availability was not examined on either island.) Differences in wet–dry season diet composition were statistically significant on Barbados (much more fruit in the wet season, more seeds in the dry) but perhaps unsurprisingly were not on St Vincent (the wet island surrogate for St Lucia, from where Bird was unable to obtain dietary data).

FORAGING BEHAVIOUR

Unsurprisingly, the two populations' different diets were obtained in different fashions: *barbadensis* spent fully half its time feeding on the ground, which *sclateri* almost never did; *barbadensis* foraged only half the time at 1–12 m, where *sclateri* foraged nearly exclusively. Correspondingly, feeding postures and gleaning techniques also differed (Table 2). In the dry season *barbadensis* increased seed eating, insect eating and ground foraging (the latter almost doubling); dry-season foraging data were unavailable for *sclateri*. Data on flock sizes were not collected, as *sclateri* is essentially solitary, and *barbadensis* more gregarious although not properly 'flocking'.

NEST BUILDING, PARENTAL CARE AND AGGRESSION

The most obvious difference between *barbadensis* and all other Lesser Antillean Bullfinches is male coloration. Not unexpectedly, relatively cryptically coloured male *barbadensis* behaved quite differently from non-cryptic *sclateri*. Male

TABLE 3

Results of MANOVA contrasting seven *sclateri* and *barbadensis* measurements (mm) of males: wing chord, tail, tarsal width, exposed culmen, bill width @ proximal end of nares, middle-toe claw, and hind-toe claw. MANOVA pairwise comparisons shown for the only two features differing significantly (bill width and tarsal thickness).

Variable	**Mean**	**Std Err**	**Lambda**	**F**	**df**	**P**
bill width						
barbadensis	5.500	0.129	4.127	4.127	1,14	.0616
sclateri	5.083	0.154				
tarsal thickness						
barbadensis	2.850	0.076	13.443	13.443	1,14	.0025
sclateri	2.417	0.083				
Omnibus MANOVA	**Value**	**F**	**df**	**P**		
Wilks's Lambda	0.788	4.237	7,8	0.0301		

barbadensis expended more than twice as much nest-building effort as *sclateri* and fed incubating females twice as frequently, and their incubation bouts were only half as long as those of *sclateri*, as were their inter-incubation intervals. Once young hatched, male *barbadensis* made 50% more feeding trips per unit time, and females 70% more, than *sclateri*. Conversely, both male and female *barbadensis* spent only about half the time at the nest during each feeding bout than did *sclateri* males and females.

Cryptically coloured male *barbadensis* remained in the vicinity of their nests five times longer than did *sclateri* from nest building through brood rearing; were strikingly (4–8 times) more likely to chase intruders (especially during incubation); and 'sang' 3–14 times more frequently than did *sclateri* males. Aggression towards conspecifics was not significantly different under high and low densities on Barbados, but was higher than on St Lucia (*sclateri*), where bullfinch densities in 'semi-residential lowlands' were essentially identical to those of *barbadensis*. Categorical responses to both avian (especially Green Heron *Butorides virescens*,

TABLE 4

Results of mtDNA analyses sequencing 842 bp of overlapping ATPase-6 and ATPase-8 genes in haplotypes of *barbadensis* and *sclateri*. Cf. Lovette *et al.* (1999) for additional information.

Variable	***barbadensis***	***sclateri***
Sample size	21	36
Range of pairwise nucleotide differences within	0–2	1–7
Range of pairwise nucleotide differences between	-	3–7
Minimum pairwise divergence between	-	0.36%

Broad-winged Hawk *Buteo platypterus*, American Kestrel *Falco sparverius*, Carib Grackle *Quiscalus lugubris*, Grey Kingbird *Tyrannus dominicensis*, Tropical Mockingbird *Mimus gilvus*) and non-avian (typically *Anolis* spp., domestic cat *Felis sylvestris*) predators on various islands were even more dramatic: male *barbadensis* generally aggressively attacked and vocalised, when male *sclateri* remained completely silent and/or fled.

Body architecture

Structural differences between male *barbadensis* and *sclateri* are not immediately obvious, but our own measurements of males of both taxa in the collections of the Museum of Comparative Zoology (MCZ), Cambridge, Massachusetts, USA, revealed that *barbadensis* males had almost 50% thicker (stouter) tarsometatarsi and 10% broader bills than *sclateri* males. Overall, males of the two populations differed significantly when all measurements were analysed using multivariate techniques (Table 3), although these results may signify only multivariate mean differences, not individual diagnosability.

Bird (1983) measured several structural variables in *barbadensis* and *sclateri*, searching for sexual as well as population differences. Two measures of bill length (exposed culmen, nares to tip) were inconclusive or contradictory, owing perhaps to small sample sizes, although she did demonstrate that bill depth, flattened wing and tail lengths of both *barbadensis* and *sclateri* males exceeded those of females. She also measured 'tarsal length' but in two ways that were not so unequivocally described as to allow confident replication. The first she called 'tarsus 1: length of tarsometatarsus,' and the second 'tarsus 2: distance from proximal end of tarsometatarsus to distal margin of last undivided scute.' 'Tarsus 2' (which she believed 'accurate only to 2 mm') would seem the conventional tarsus measurement but she did not so state, despite citing Baldwin *et al.* (1931). Moreover, she referred to 'tarsus 1' as 'length of tarsus,' a term Baldwin *et al.* (1931) would restrict to her 'tarsus 2.' In any case, she failed to find sexual differences in either *barbadensis* or *sclateri* using 'tarsus 2' measurements, but did with 'tarsus 1.' Finally, although she did compare 'tarsus 1' and 'tarsus 2' measurements for male and for female *barbadensis* to male and to female *sclateri*, respectively, she presented no raw data or sample sizes, opting for a table that nonetheless indicated that by both methods *barbadensis* had highly significantly longer tarsi than *sclateri*.

Mitochondrial DNA

Lovette *et al.* (1999) analysed mtDNA from eight resident passerines on Barbados, among them Lesser Antillean Bullfinches from Barbados (*barbadensis*), St Lucia (*sclateri*), and St Vincent (*crissalis*), to ascertain patterns and timing of colonisation on Barbados. Initially the entire 894–bp mtDNA genomes for ATPase 6 and ATPase 8 for five *barbadensis* and *sclateri* were sequenced to confirm and characterise inter-island differentiation, followed for an additional 21 *barbadensis* and 32 *sclateri* by either Restriction Fragment Length Polymorphism (RFLP) digestion of

PCR-amplified products, or by additional sequencing. To examine individual island monophyly, enzyme cleavage and RFLP gels were compared among islands, and sample sizes used (Table 4) were regarded as adequate for detection of low-frequency haplotypes. They found (1) no evidence of any founder-effect on the three islands; (2) only a single clade of lineages on each of the three islands (i.e., reciprocal monophyly between islands); (3) that the three taxa had accumulated 3–5 substitutions among the three islands; (4) that although *barbadensis* and *crissalis* had 0.60% nucleotide divergence, *barbadensis* and *sclateri* differed by only 0.36%, implying St Lucia to be Barbados's source population; and (5) assuming a uniform molecular clock, consistently low levels of mtDNA differentiation on Barbados indicating relatively recent colonisation events by at least four species, the Lesser Antillean Bullfinch among them.

Discussion

Bird's (1983) ecological and behavioural data demonstrate that *barbadensis* differs from *sclateri* in diet (particularly during Barbados's stressful dry season, to which it seems well adapted), foraging behaviour, nest attentiveness, and aggression. At all stages in its breeding cycle, *barbadensis* biology is in many respects (including overall coloration but excluding sexual dichromatism) more like that of a grassquit *Tiaris* spp. than all other Lesser Antillean Bullfinches. Granivory and insectivory are well-known avian adaptations to xeric environments (Lack 1976), and Barbados is among the driest of Lesser Antillean islands. Food pressures are greatest in dry seasons, when both insects and seeds are more buffered from immediate climatic vicissitudes than is fruit, so facultative granivory/insectivory assumes high selective value under such conditions. Ground foraging is obviously associated with granivory, and pale and/or cryptic coloration is another classic avian adaptation for terrestrial foraging. This is not to say that *barbadensis* is not an arboreal forager or frugivore; it most certainly is during the wet season, as one would expect of a generalist. Higher feeding rates of *barbadensis* males are probably a function of the low energy content of small seeds, and increased feeding in turn leads to more frequent encounters with conspecifics, etc. There are no resident hawks or owls on Barbados, so such predation pressure on adults as now exists probably comes largely from feral quadrupeds and perhaps grackles. Even though these were surely unimportant in the evolution of *barbadensis* monochromatism, it remains wholly conjectural what might have been.

There have been occasional references in the literature to partially or wholly black male bullfinches on Barbados (e.g. Hellmayr 1938, Bird 1983), usually attributed to new St Lucia or St Vincent immigrants or to residual ancestral variation within *barbadensis*. We believe that, owing to the distance between St Lucia and Barbados and prevailing easterly trade winds, it is likely that few if any bullfinches continue to arrive unassisted on Barbados from St Lucia (with no evidence of any ever having arrived from St Vincent). However, this does not preclude occasional ship-borne transport by inter-island ferries, although we are also aware of no shipboard observations of Lesser Antillean Bullfinches near Barbados. At any rate, cock-feathered males are excessively rare on Barbados, and several active observers with 120+ years of combined field experience on Barbados (E. B. Massiah, M. D. Frost, the late M. Hutt and the late H. F. Hutt pers. comms.) have never seen or heard of a single one. Whether from natural colonisers, ship-assisted waifs or intra-Barbados recombination, genes of such individuals would quickly be swamped on Barbados.

Why has *barbadensis* diverged so greatly from all other Lesser Antillean Bullfinches? There are several not mutually exclusive possibilities: (1) the potential for eco-typical differentiation within the Lesser Antillean Bullfinch complex is well established (see above); (2) molecular analyses found Barbadian Black-faced Grassquit's mtDNA nucleotide divergence from St Lucia birds to be 0% (Lovette *et al.* 1999), indicating recent arrival on Barbados. Thus, in the absence of past competition from its most likely ground-feeding, seed-eating emberizine competitor, 'proto-*barbadensis*' could have quickly moved into an important vacant niche; (3) body-structure differences (especially stouter tarsi and wider bills) are clearly associated with, respectively, terrestrial habits and increased seed-eating. (In our own analyses, length of hind claw, another cursorial adaptation, approached statistical significance); (4) Barbados is radically different from almost all other Lesser Antillean islands in geological history, soil, climate and vegetation; and, (5) Barbados is sufficiently far east of the main Lesser Antillean arc to preclude repeated reinvasion from source populations.

Hellmayr (1938) assumed that monochromatism in *barbadensis* was a primitive or ancestral condition and that sexual dichromatism in all other Lesser Antillean Bullfinch populations derived from it, but we now know that *barbadensis* derived from a surely dichromatic St Lucia population, not the reverse. Bird (1983) on the other hand did not specifically address this question, although suspecting (based on a single Barbados male with some blackish body and rufous throat feathers) that the Barbados founding population was dichromatic and thus that *barbadensis* was secondarily monochromatic. We believe it is taxonomically significant that despite plumage and structural changes within the nine currently recognised Lesser Antillean Bullfinch subspecies, eight have nonetheless retained sexual dichromatism.

We are unaware of any published studies of the Lesser Antillean Bullfinch nuclear genome (including micro-satellites), so all inferences concerning the age of various populations rely on mtDNA data. These offer several possible sources of error, some of which are amenable to study, some not: (1) it is possible, although quite unlikely, that rare *barbadensis* haplotypes in *sclateri* were not detected; (2) the 'mean rate' of mtDNA accumulation customarily used for passerines (2% per My) surely varies among genera and species, yet it is exceedingly difficult to calibrate the absolute rate for a single species, or to calculate error terms; (3) the duration of time required for each taxon to complete the biological speciation process is unique;

(4) statistical separation of small among-species differences in percent nucleotide divergence requires much larger samples than have been available; and, (5) the approach used by Lovette *et al.* (1999) would fail to detect earlier invasions masked by complete replacement of mtDNA lineages, although the probability of an invading haplotype wholly replacing a resident one would be very small indeed (1/population size).

Nonetheless, given that geological data strongly support Barbados's emergence =700,000 y BP; assuming a molecular clock with a nucleotide substitution rate of 2% per My; accepting that *barbadensis* is monophyletic in origin; and agreeing that the 0.36% nucleotide substitution divergence between *barbadensis* and *sclateri* is approximately correct, we reason, after consideration of the potentially confounding factors noted above, that proto-*barbadensis* probably invaded Barbados from St Lucia sometime 700,000–180,000 y BP—and considerably closer to the latter than the former considering mtDNA data from four Barbados taxa.

Although courtship, pair formation and attendant displays (postural and vocal) have never been studied in *Loxigilla*, we suggest that females choose males and non-randomly, given that female choice is customary in strongly sexually dichromatic passerines. We further propose that male advertising song plays a major role, as does distinctive male plumage (and thus that sexual selection operates to some degree within the dichromatic species), but that the importance of both has been severely curtailed in sexually monochromatic *barbadensis*. We further propose that *barbadensis* females choose their males using behavioural or fitness characters such as frequency of song, aggression toward conspecifics and predators, and frequency and quality of courtship feeding. Finally, we consider that this complex of factors, coupled with other behavioural and ecological features, especially loss of distinctive male plumage, has resulted in *barbadensis* having diverged so far from *noctis* stock as to have achieved biological-species status. Collectively these notions offer fertile ground for vocal playback and plumage-alteration experiments designed to elucidate the exact operation and relative roles of isolating mechanisms, whose existence we do not doubt.

Peterson (1996) accumulated many instances of geographic variation in avian sexual dichromatism. He determined that whilst variation in coloration of either sex was about equally likely, males were about five times more likely to lose than to gain bright plumage (reflecting initial incidence), and although males of island populations were more likely to lose than gain bright colour, they were not necessarily more likely to do so than their continental counterparts. He suggested that sexual dichromatism characters are likely to have a simple Mendelian or sex-linked basis whose alleles may be segregating in wild populations. Granted that plumage aberrations in wild birds often follow Mendelian inheritance (reviewed in Buckley 1987), the evidence for widespread Mendelian inheritance of species-specific characters is less strong. Further, Peterson (1996) asserted that loss and/or gain of bright or dull plumage (especially on islands) is more frequently due to genetic drift than to selection. He did acknowledge, though, that loss of bright male plumage might play a significant role in biological speciation, although allopatry would prevent the majority of island examples from being tested in nature.

Doherty *et al.* (2003) considered what effect sexual selection might have on local extinction rates and turnover in avian communities. Extending earlier work indicating that dichromatic waterfowl (Promislow *et al.* 1994) and passerines (Promislow *et al.* 1992) seemed to suffer higher mortality rates than sexually monochromatic congeners, Doherty *et al.* (2003) modelled 21 years of data from the North American Breeding Bird Survey (BBS), finding that dichromatic species showed a mean 23% increase in annual local extinction rates over monochromatic species per BBS survey route. But they unexpectedly also showed that this increase in local extinction was almost exactly offset by local immigration and recolonisation, leading to relative community stability. Whereas this offset may occur regularly in continental settings, it is demonstrably rare on oceanic islands (MacArthur & Wilson 1967), which may explain the disproportionately large number of monochromatic bird species on such islands.

We believe it most likely that ancestors of the present-day West Indian endemic emberizine assemblage (*Loxigilla*, *Melopyrrha*, *Melanospiza*), irrespective of number of invasions, were dichromatic, possibly akin to present-day *Volatinia,* and that there has been strong stabilising (sexual?) selection to maintain dichromatism. We consider that the plumage, behavioural and structural changes that have occurred in Lesser Antillean Bullfinch populations in general (and Barbados Bullfinch in particular) have a nuclear genetic basis that has been selected for. Therefore, Barbados Bullfinch would show both nuclear and mitochondrial evolution, the package comprising sufficient divergence from the main line of Lesser Antillean Bullfinch evolution as to have developed concomitant prezygotic reproductive isolating mechanisms.

Thus, we suggest that the form of 'Lesser Antillean Bullfinch' on Barbados is best treated as a separate biological species, **Barbados Bullfinch *Loxigilla barbadensis* Cory 1886**, which probably colonised Barbados from St Lucia around 180,000–700,000 y BP, and which has achieved specific status since its arrival. As such this represents one of the more rapid examples of avian speciation, but because this happened in an oceanic island context, it is perhaps less surprising; e.g. Klicka & Zink (1997) have also noted, on the basis of mtDNA chronology, that a few avian species do appear to have arisen unexpectedly rapidly.

And what of the low level of mitochondrial nucleotide divergence found by Lovette *et al.* (1999) for *barbadensis*? Accepted practice, developed from divergence levels of known species-pairs, indicates that values below *c.*3% indicate only subspecific differentiation. Yet it is already known that birds may display pronounced, nuclear-genetic-based geographic variation that is not mirrored in mtDNA (e.g. Brawn *et al.* 1996). We believe Barbados Bullfinch is another example, and suggest that this phenomenon may be more common on oceanic islands than continents. We would also argue that whenever possible, it is better science to infer taxonomic status from non-molecular evidence, and then to use molecular data to derive time since colonisation, hence timing and duration of speciation.

Increasingly, genetic and ethological studies are suggesting that island bird populations formerly lumped into polytypic species-complexes can be considered biological species just as parsimoniously. In the West Indies alone, the four endemic *Myiarchus* flycatchers were split into seven (Lanyon 1967); each of the four allopatric subspecies of 'Stripe-headed Tanager, *Spindalis zena*', is now considered a species (Garrido *et al.* 1997); each of the three isolated subspecies of '*Dendroica adelaidae*' is now considered a species (Adelaide, Barbuda and St Lucia Warblers, respectively; Lovette *et al.* 1998); the isolated (and still extant?) Puerto Rican Bullfinch *Loxigilla portoricensis* on St Kitts has just been recognised as St Kitts Bullfinch *L. grandis* (Garrido & Wiley 2003); and the taxonomic status of the two allopatric Cuban Bullfinch *Melopyrrha nigra* populations is also under evaluation (J. Wiley, pers. comm.). To this group we now add Barbados Bullfinch.

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New and interesting records of birds from Ayabaca province, Piura, north-west Peru

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Because almost every reasonably-sized remnant humid forest in south-west Ecuador has been recognised as a Key Area for bird conservation in South America (Wege & Long 1995), it is clear that more field work is needed to assess the conservation status of areas in adjacent parts of north-west Peru. Some of the northernmost humid forests in this region are in the province of Ayabaca (dpto. Piura). Much field work has been performed in neighbouring Ecuador, within 50–100 km to the north/north-west (e.g. Bloch *et al.* 1991, Williams & Tobias 1994, Best & Kessler 1995). Approximately 80 km to the south, relatively extensive investigations were conducted, primarily in the 1920s and 1930s (Palambla) and in the 1970s (near Canchaque and Huancabamba) (Parker *et al.* 1985). Ayabaca has largely escaped such attention, although Best *et al.* (1993) presented some field data for the region, and additional information is available in Schjellerup (2000). This paper reports on the results of field work in Ayabaca, in 2000, and aims to clarify the conservation status of humid forests in the area.

The avifauna of the province is interesting as it represents a transition between several biogeographic regions and Endemic Bird Areas (EBAs). The province straddles parts of three EBAs, Central Andean Páramo (EBA 043), the Tumbesian region (EBA 045) and the Southern Central Andes (EBA 046) (Stattersfield *et al.* 1998). The latter two are of interest in this study, as will be discussed.

The work by Best *et al.*, which was centred on the Bosque de Cuyas on Cerro Chacas (see below), subsequently led to its inclusion in the Southern Central Andes EBA (046), and to its recognition as a Key Area for bird conservation in South America (Wege & Long 1995), due to the presence of a number of threatened species (Collar *et al.* 1994).

Ayabaca is one of eight provinces that comprise the department of Piura. It is bordered to the north and north-east by Ecuador and to the west, south and south-east by the provinces of Sullana, Piura, Morropón and Huancabamba. Within Piura, Ayabaca and Huancabamba are highland provinces. The altitude of Ayabaca in general rises from 400 m in the west to over 3,000 m in the east. The economy is split broadly between subsistence agriculture in the highlands and rice production and cattle ranching at lower elevations. The capital, the town of Ayabaca (04°38'S, 79°42'W) lies at 2,700 m and is situated on the eastern flank of a mountain that reaches 3,000 m and lies west of the main Andean chain, isolated by a narrow, dry, rainshadow depression, formed by the watershed between the catchments of the ríos Calvas and Quiroz (Fig. 1). Natural habitat at all altitudes within the depression

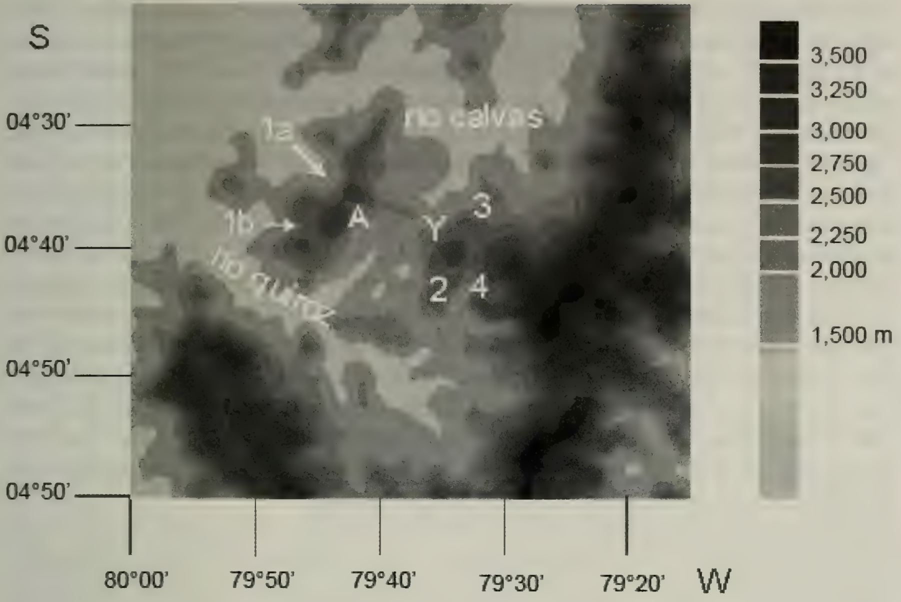

Figure 1. General area of the study sites. A: Ayabaca town, Y: Yanchalá, 1: Bosque de Cuyas (with 1a: Bosque de Cuyas and 1b: Bosque los Molinos), 2: Aypate, 3: El Toldo. The locality indicated by 4 is Huamba, data for which (Schjellerup 2000) have been used in comparison. Heights have been interpolated from the GLOBE-DEM dataset, www.ngdc.noaa.gov/seg/topo/globeget.shtml. The map covers parts of Peru and Ecuador, but the political boundary is not indicated.

(minimum altitude 2,000 m) is severely degraded by human activities. Various patches of more or less intact forest remain on the slopes east of the depression, which are connected to the main Andean chain by ridges above 2,500 m.

Study sites and methods

The study focused on three forests at higher altitudes (generally above 2,400 m) of Ayabaca province, one on Cerro Chacas, a mountain isolated from the main Andean chain (Bosque de Cuyas), and two on a spur on the west slope of the main Andean chain (Aypate and El Toldo; see Fig. 1). Aypate is on a somewhat isolated mountain connected to the main Andean chain by a ridge. For each site the coordinates reflect the general area of the sites.

Bosque de Cuyas (04°36'S, 79°44'W, 2,200–3,100 m) 29 June–1 July 2000 and 5–9 July 2000. Includes the Key Area of Cerro Chacas (Wege & Long (1995). However, the forest extends from Cerro Chacas, incorporating other cerros and quebradas, so the locally used name Bosque de Cuyas seems more appropriate in describing this location. A neighbouring forest, Bosque Los Molinos, at the head of the Quebrada Corriente de los Molinos, was visited briefly on two occasions. This forest is connected to Bosque de Cuyas, with Cerro Llantuma (or Yantuma) between them, and the entire area should be considered a single forest. The total area of forest is estimated at 1,000 ha, with Bosque de Cuyas covering 600 ha and Bosque Los Molinos 400 ha. Forest commences at 2,200 m and reaches 2,900 m. Still higher (but over a rather limited area), forest is replaced by patches of elfin forest or tussock grassland grazed by cattle. Although most remaining forest has been modified by man, with timber extraction, and cattle grazing the understorey, patches of primary forest persist on the steepest slopes. Within better-conserved or primary forest, the general profile consists of a tree layer with dominant families such as Lauraceae, Melastomataceae, Myrsanaceae, Clusiaceae, *Erythrina* spp., Ericaceae and Arecaceae, occasionally reaching 20–30 m tall and diameters of up to 1 m. Below this a scrub or bush layer with dominant *Baccharis* sp., *Vervesina pentantha* (Asteraceae), Piperaceae, Solanaceae, Papilionaceae, Amaryllidaceae and Clorantaceae, reaches a maximum height of 6 m, and there is a herbaceous layer with a mix of vines, tree-ferns, orchids such as *Epidendrum* spp., *Lepanthes* spp. and *Pleurothallis* spp., mosses, lichens and bromeliads.

Higher páramo vegetation is dominated by stunted communities consisting of Ericaceae (*Befaria* sp.), Melastomataceae, Myrsanaceae, Rubiaceae, Fabaceae, Amaryllidaceae (*Bomarea* sp.), Asteraceae (*Baccharis* sp.), Clusiaceae, Piperaceae, with a mix of bushes and grasses, such as Tibouchina (*Baccharis* spp.), *Lupinus silvestris* (Fabaceae), *Fuchsia* sp. (Onagraceae), *Gentiana* spp., *Halenia* spp. (Gentianaceae), as well as various Poaceae (*Chusquea* sp., *Stipa* sp.). Secondary forest consists of Amaryllidaceae (*Bomarea* spp.), Asteraceae (*Onoseris* sp., *Mixania* sp., *Senecio* sp.), Clusiaceae (*Clusia* sp., *Hypericum* sp.), Ericaceae (*Bejaria* sp., *Cavendishia* sp.), Myrsianaceae (*Cybianthus rhopaloides*, *Myrcine* sp.), Solanacea (*Ichoma* sp.), Piperaceae (*Piper* spp.), Campanulaceae (*Siphocampylus* sp.), Cyatheaceae (*Cyathea* spp.), Droseraceae (*Drosera* sp.), Gentinaceae (*Gentina* sp., *Halenia* sp., *Sybolanthus* sp.), Melastomaceae (*Brachyotum* sp., *Miconia* sp., *Tibouchina* sp.) and Rubiaceae (*Cinchona calisaya*, *Cinchona* sp.).

As some 60 ha of Bosque de Cuyas are owned by the Municipal Council of Ayabaca, which is interested to protect the forest and implement a management plan for the area, the authors provided their data on the region.

Aypate (04°42'S, 79°35'W, 2,800–3,100 m) 2–4 July 2000. Aypate is known nationally and, to a certain extent, internationally as an important Inca site on the Inca highway between Cusco and Cajamarca. The total forest is estimated to cover 600–800 ha, although locals are clearing new fields. The forest is separated from the Bosque de Cuyas, some 17 km away, by the depression mentioned above (see Fig. 1). However, it is connected to the forests above El Toldo and the main Andean chain by ridges, dotted with native humid shrub and hedges, above 2,500 m.

El Toldo (04°40'S, 79°31'W, 2,800–3,100 m) 10–13 July 2000. A number of forest patches exist near this small village. The general area is well known for its archeological interest because of the presence of the Samanga petroglyphs. We visited one forest patch of *c*.400 ha, two hours walk above the village, at the head of the Quebrada el Toldo. Understorey was degraded by grazing cattle. Other patches of similar size were noted in the vicinity, one of which, above Huamba, has been visited twice by expeditions from the University of San Marcos in Lima (Schjellerup 2000), see Appendix 1.

Field work was conducted on 1–13 July 2000 by JMNF, TM and WPV. Intensive, opportunistic birding was complemented by modest mist-netting efforts. Vocalisations were routinely recorded. We were joined by Abundio Segastagui of the Universidad Nacional de Trujillo who studied the flora of the three locations (Segastegui unpubl.).

Records of interest

Best *et al.* (1993) mentioned 59 species for Bosque de Cuyas, recorded during seven field observer days. Inevitably, we encountered a number of new species for this forest which, together with several unpublished records (see Acknowledgements), brings the number of species recorded in Bosque de Cuyas to around 110. No records from the other two forests were available previous to our study, during which *c*.65 species were recorded both at El Toldo and at Aypate. The complete lists of species recorded at each site are presented in Appendix 1. Threat status, where applicable, is taken from BirdLife International (2000): VU = Vulnerable and NT = Near Threatened.

BEARDED GUAN *Penelope barbata* (VU)

The species' presence at Bosque de Cuyas was reconfirmed and moreover its local distribution was determined to extend to Bosque los Molinos. Several were encountered on a daily basis. We also found it at Aypate and El Toldo, new localities for this globally threatened species (BirdLife International 2000, Flanagan *et al.* 2000). Although threatened by habitat destruction and hunting, this guan persists for now in small fragments of forest with disturbed understorey. Locals admit to continued hunting of this species (at least in Bosque de Cuyas and El Toldo), which some refer to as 'pucacunga' or 'bare-throat' in Quechua.

OCHRE-BELLIED DOVE *Leptotila ochraceiventris* (VU)

Best *et al.* (1993) mentioned the only record of this threatened species at Bosque de Cuyas. We failed to relocate the species, and suggest that more tangible evidence of the species' presence at this locality is required.

PARAKEETS *Aratinga* sp.

On 9 July a flock of 25–30 *Aratinga* sp. parakeets was noted flying over the lower section of Bosque de Cuyas, at *c.*2,200 m. Another flock of *c.*40 *Aratinga* sp. was observed flying across the road between Ayabaca and Yanchalá at approximately the same elevation. These may have either been Scarlet-fronted Parakeet *A. wagleri* or Red-masked Parakeet *A. erythrogenys*. *A. wagleri* is unknown from the area and is only infrequently recorded in adjacent Ecuador, whilst *A. erythrogenys* is known from the general area. Although usually encountered at lower altitudes, it has apparently been recorded as high as 2,500 m in Utuana, Ecuador (Ridgely & Greenfield 2001).

SCALY-NAPED PARROT *Amazona mercenaria*

Although not recorded during our study, the species has been recorded on several occasions (in July 1998 and November 2000) in Bosque de Cuyas by JNMF. It is not considered resident. The nearest records for the species are from Amaluza, Ecuador (Williams & Tobias 1994) and Cerro Chinguela (Parker *et al.* 1985).

STYGIAN OWL *Asio stygius*

Three pairs were heard along a 2-km stretch of the main road through Bosque de Cuyas between *c.*2,200–2,600 m on the evenings of 6–7 July. All were calling from the canopy of mature primary forest. Calls commenced shortly after sunset, and continued throughout the night on 6 July. On 6 July a pair was sound-recorded for 20 minutes giving an antiphonal duet (published in part on Krabbe *et al.* (2001). The female was observed once, flying overhead in dense fog, permitting a view of the *Buteo*-like silhouette and large size. This represents only the second record in Peru, with the first, from around Sallique south of Huancabamba, still unpublished (J.P.O'Neill pers. comm.) However, the species is known from various localities in adjacent Ecuador: Sozoranga, Angashcola and the Cordillera de Quichiragua (Best & Kessler 1995), and occurrence in Peru is unsurprising. The vocalisation period in Bosque de Cuyas coincides with records from Amaluza (Williams & Tobias 1994), where the species was heard in July/August 1990 and July 1991. In Bosque de Cuyas vocalisations were not heard during visits in October and December 2000, by JNMF, nor was there response to playback on those occasions.

***AMAZILIA* SP.**

We briefly observed an *Amazilia* sp. in a *Eucalyptus* tree alongside the main road in Yanchalá (2,100 m), which leads through small agricultural fields with hedges of native forest vegetation. The bird was perched *c.*10 m up. The bill was red or dark orange with a dark, perhaps black, tip. The chin, throat, belly and vent were white or at least very pale. The bird had rufous flanks and the crown was green. Regrettably, the coloration of the upper tail was not visible. The record is interesting given recent literature concerning *Amazilia* taxa in this region. In Weller (2000) and del Hoyo *et al.* (1999) Loja Hummingbird *A. alticola* was split from Amazilia

Hummingbird *Amazilia amazilia*, but in Ridgely & Greenfield (2001) this treatment was not followed because of the existence of an as-yet undescribed form in Azuay, Ecuador. The amount and distribution of pale and rufous coloration on the observed bird accords with characters mentioned for *A.* (*a.*) *alticola* in Weller (2000), del Hoyo *et al.* (1999) and Ridgely & Greenfield (2001), but it is unclear whether *A. a. leucophaea* or *A. a. dumerilii* can be safely eliminated, as the amount of rufous apparently shows appreciable individual variation (Ridgely & Greenfield 2001). The closest locality from which *A.* (*a.*) *alticola* is known is apparently Malacatos, Loja, Ecuador (04°14'S, 79°15'W, 1,500 m). It seems to occur sympatrically with *A. a. dumerilii* in the Casanga Valley in central Loja, Ecuador (04°08'S, 79°49'W, 900 m). *A. a. dumerilii* is also known from Cruzpamba (04°10'S, 80°01'W, 1,000 m) and Paletillas (04°11'S, 80°17'W, 500 m), both in Loja, Ecuador. *A. a. leucophaea* is known from both lowland localities (north-west to Alamor, Piura, Peru, 04°29'S, 80°25'W, 110 m) and highland localities (north to Palambla, Piura, Peru, 05°23'S, 79°37'W, 1,200–2,000 m). The present record is from an area between these localities, where any of the three taxa might in principle occur. Subsequent visits to the area should aim to clarify this matter.

SMOKY-BROWN WOODPECKER *Veniliornis fumigatus*

Rather common at all localities. Of interest is the fact that it is unclear which taxon, be it *V. f. fumigatus* or *V. f. obscuratus*, is present, as *obscuratus* occurs around Huancabamba, Peru, and *fumigatus* in all Ecuadorian ranges south to Loja, but with those in south-west Ecuador apparently intermediate (Ridgely & Greenfield 2001). The characters of a male mist-netted in Bosque de Cuyas do not closely match either subspecies, although it resembled *obscuratus* more than *fumigatus*. It had a pale, whitish face contrasting sharply with the red cap and dark grey malar region. The face was palest on the lores and around the eye. The grey throat was somewhat paler than the malar region but showed no sharp contrast. Belly and mantle had a distinct olive wash, the mantle contrasting with the dark upperwing. Its appearance was rather similar to that shown in Frimer & Moller (1989) from the Cordillera Blanca.

RUFOUS-NECKED FOLIAGE-GLEANER *Syndactyla ruficollis* (VU)

This endangered Tumbesian endemic was encountered on several occasions at Bosque de Cuyas, in second growth as well as in more pristine habitat. The forest may prove to be a stronghold for this Vulnerable species.

GREY-HEADED ANTBIRD *Myrmeciza griseiceps* (VU)

No efforts were made to find this species and we failed to locate it in July 2000, but it was recorded on a subsequent visit, in December 2000, by JNMF and Rob Williams. The species may be genuinely rare in Bosque de Cuyas. It has been encountered on at least two other occasions (Best *et al.* 1993, P. Coopmans pers. comm.).

RUSTY-BREASTED ANTPITTA *Grallaricula ferrugineipectus* (*leymebambae*?)
Encountered at 2,200 m in Bosque de Cuyas, where it had earlier been found by P. Coopmans. The species only sang early morning. The habitat, of rather sparse understorey, agrees with the literature (Fjeldså & Krabbe 1990). Long known from the west slope of the Andes in Peru from specimens taken independently by Parker and Koepcke at Canchaque (Parker *et a*l. 1985), and more recently in Ecuador, at Utuana (P. Coopmans unpubl.), the population is apparently isolated from that on the east slope south to Bolivia, *G. f. leymebambae*. The closest known population of *leymebambae* appears to be that recently discovered at Cerro Wicsocunga (06°05'S, 78°20'W), on the north-westernmost spur of the Cordillera Central, above the town of Lonya Grande, dpto. Amazonas (TRM & L. Augustine unpubl.).

BLACKISH TAPACULO *Scytalopus latrans subcinereus*
The only *Scytalopus* at the study sites. Individuals were observed chasing one another uttering excited calls. The reason for such behaviour, which once involved three individuals, is unclear but may have represented a type of territorial behaviour or be related to breeding activity.

GOLDEN-CROWNED FLYCATCHER *Myiodynastes chrysocephalus* (*minor*?)
Twice an adult was observed feeding two fledged young. This rather isolated record appears to be the first west-slope record for Peru. Although not identified to subspecies level, it was probably *M. c. minor*, which in Ecuador occurs on the west slope south to western Loja, where apparently fairly common in small (<1 ha) woodlots intermixed with fields and plantations at Alamor (03°52'S, 80°05'W), *c*.110 km from Bosque de Cuyas (Williams & Tobias 1994), and along the east slope as far south as the Cordillera del Condor (Ridgely & Greenfield 2001). The nominate race is broadly distributed, on the east slope, from Peru to Bolivia, but is only known south of the Marañón. This would be the first record of *minor* in Peru. Apparently unknown on the east slope north of the Marañón in Peru, where it is, however, likely to occur.

PIURA HEMISPINGUS *Hemispingus piurae*
This distinctive endemic taxon is easily encountered in Bosque de Cuyas, but is apparently absent at the other localities. It was recently suggested to split this taxon at specific level from *H. melanotis* based on a phylogenetic analysis (García-Moreno *et al*. 2001).

MASKED SALTATOR *Saltator cinctus* (NT)
One above El Toldo perched motionless for *c*.30 seconds in the open on a thick horizontal branch dotted with mosses and bromeliads, some 10 m above ground. Simultaneously, a typical flock containing Pearled Treerunner *Margarornis squamiger*, Streaked Tuftedcheek *Pseudocolaptes boissoneautii*, Blue-capped Tanager *Thraupis cyanocephala*, Blue-and-black Tanager *Tangara vassorii*, Brown-

capped Vireo *Vireo leucophrys*, Superciliaried Hemispingus *Hemispingus superciliaris* and Blue-backed Conebill *Conirostrum sitticolor* was passing through the vicinity. The saltator may have been associated with this flock, although we did not find it again in similar flocks. This is one of the few observations in Peru, although the species was already known to occur in the general area (Schjellerup 2000). It has been suggested that it depends on *Chusquea* or on *Podocarpus* cones (BirdLife International 2000). Both vegetation types were present in the forest, but neither was common.

NORTHERN RUFOUS-NAPED BRUSH-FINCH *Atlapetes latinuchus* ssp.
The taxa most likely to occur in Ayabaca, *A. l. comptus* and *A. l. latinuchus* have recently been treated as subspecies of a single species (García-Moreno & Fjeldså 1999), and generally characterised by the lack of a black forehead, sharp demarcation between the rufous cap and greyish back, long yellow malar stripe, light melanisation on the flanks, and white speculum in several populations. Fjeldså & Krabbe (1990) and Ridgely & Greenfield (2001) described further distinguishing

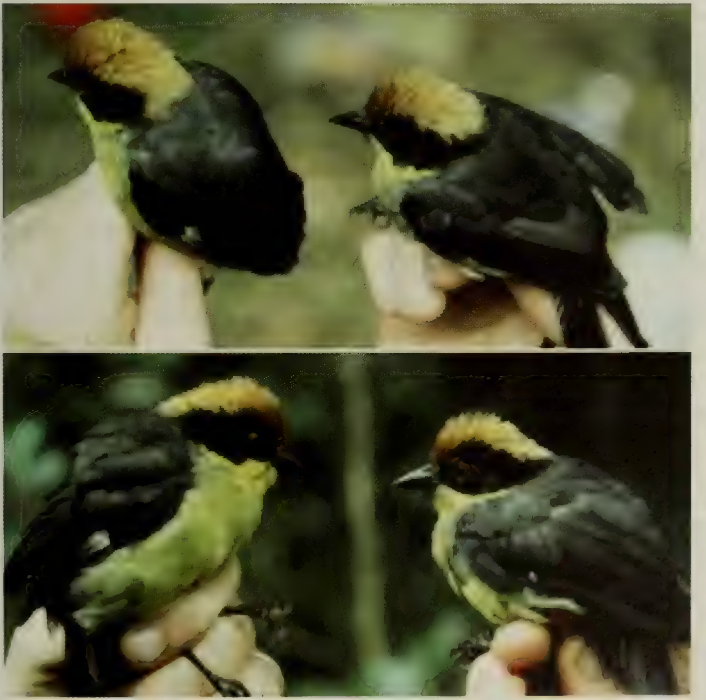

Figure 2. Two Northern Rufous-naped Brush-finches *Atlapetes latinuchus* mist-netted together at El Toldo. Note the difference in speculum and extent of the pale nape (Willem-Pier Vellinga)

TABLE 1

Distinguishing characters of subspecies of Northern Rufous-naped Brush-finch *Atlapetes latinuchus*, based on Fjeldså & Krabbe (1991), García-Moreno & Fjeldså (1999), Ridgely & Greenfield (2001) and specimens in Louisiana State University Museum of Zoology.

	crown	**speculum**	**supraloral spot**	**submalar streak**
A.l.latinuchus	chestnut (paler on nape south of Marañón)	medium	vestigial or absent	very faint, variable
A.l.spodionotus	chestnut	never	never	moderate
A.l.chugurensis	light chestnut, paler on nape	never	never	very faint
A.l.comptus	rufous or chestnut in Ecuador: usually paler than *A.l.spodionotus*, especially on nape	never	large (reduced in some)	distinct

characters of these taxa. These characters and an indication of their variability, based on specimens of *A. latinuchus* in the Louisiana State Uuniversity Museum of Zoology, are described in Table 1.

In Bosque de Cuyas we encountered birds on which the supraloral spot (never large, never absent) and the submalar streak (usually distinct, sometimes faint) were variable, and on which the nape was distinctly paler than the crown. We never observed a speculum on these birds, neither in the field or in the hand. Similar birds were encountered at Aypate. These brush-finches seemingly possess traits similar to those described for *A. l. comptus* in Ecuador (for which we lack information on variability in the malar streak). Birds were encountered in a range of habitats, ranging from low scrub and hedges between fields to the undergrowth and canopy of the tallest trees in primary forest. Similar catholic tastes in habitat have been noted for *A. l. comptus* in the Celica mountains in Ecuador (Bloch *et al.* 1991).

In sharp contrast, birds above El Toldo showed clear variation in the extent of the speculum; all those observed in the field had at least a hint of this and in some it was very obvious. Of two birds caught simultaneously (Fig. 2), one had a speculum consisting of white patches on the base and centre of the seven outermost primaries, whereas the other only showed a hint of a speculum, consisting of a little white on the five outermost primaries. Both had a faint submalar streak and no supraloral spot. The extent of rufous in the crown and nape differed appreciably between them; the crown and nape of that with a speculum extended further onto the back, ending in a squarish shape, as opposed to a more rounded shape in the other. That without a clear speculum resembled *A. l. comptus* from Ecuador, whereas the other clearly showed characters of both *A. l. latinuchus* and *A. l. comptus* from Ecuador. Comparison of the characters of these birds with those shown in Table 1 shows that they cannot be safely attributed to either currently recognised subspecies. Variation among taxa of *A. latinuchus* in this region, especially the fact that strikingly different forms occur syntopically, warrants further investigation.

Altitudinal extensions

PAURAQUE *Nyctidromus albicollis*
The familiar call was recorded at Bosque de Cuyas and Aypate. A pair was mist-netted at Bosque de Cuyas. At Aypate birds were calling and observed flying around our camp near the ruins at 2,800 m. These records are high for the species, the record at Aypate apparently representing an elevational extension of *c*.500 m over published data (Fjeldså & Krabbe 1990).

ECUADORIAN PICULET *Picumnus sclateri*
One at the lower edge of Bosque de Cuyas, at 1,900 m, was apparently somewhat high. Ridgely & Greenfield (2001) described an altitudinal range of 1,500–1,700 m for the population in Loja, Ecuador, but it has been seen there at nearly 2,000 m (P. Coopmans pers. comm.).

CHAPMAN'S ANTSHRIKE *Thamnophilus zarumae*
A Tumbesian encountered daily in and around Bosque de Cuyas, in disturbed as well as pristine habitat. Also recorded at Yanchalá, in hedges of native vegetation. Near Ayabaca birds were seen at 2,700 m. It has been recorded as high as 2,500 m at Utuana, Ecuador, and 2,550 m at Amaluza, Ecuador (Ridgely & Greenfield 2001).

GREY-BREASTED MARTIN *Progne chalybea*
Fifty were present in Ayabaca town, at 2,700 m, during our entire stay. They were also encountered feeding above Bosque los Molinos. This appears to be a new altitudinal record for the species, which seems to occur to *c*.2,000 m in southern Ecuador, with one record from 2,570 m (Ridgely & Greenfield 2001).

Breeding activity

In July 2000 evidence of breeding activity for the following species was obtained. **Speckled Hummingbird** *Adelomyias melanogenis*: fledged juvenile apparently being fed by an adult at Bosque de Cuyas. **Sparkling Violetear** *Colibri coruscans*: nest building below an overhang beside the road outside Ayabaca to Bosque de Cuyas. **Grey-breasted Mountain-toucan** *Andigena hypoglauca*: fledged juvenile accompanied by persistently alarm-calling adults at El Toldo; the juvenile clambered to a height of *c*.3 m in small trees. **Line-cheeked Spinetail** *Cranioleuca antisiensis*: a juvenile mist-netted at Bosque de Cuyas. **Ash-coloured Tapaculo** *Myornis senilis*: one in juvenile plumage observed near Aypate. **Barred Fruiteater** *Pipreola arcuata*: fledged juvenile accompanied by both adults at El Toldo. **Northern Rufous-naped Brush-finch** *Atlapetes latinuchus*: single fledged juveniles accompanying small groups of adults in low secondary vegetation at El Toldo.

Discussion and conclusion

The Bosque de Cuyas forms an isolated island of humid montane cloud forest on the eastern fringe of the Tumbesian region, to the west of nearby humid montane cloud forests in the main Andean chain (Fig. 1). Similar forest is still found on a number of isolated mountains above 2,500 m in neighbouring Ecuador: east of Gonzanamá (*c.*04°13'S, 79°24'W), in the Celica range (*c.*04°03'S, 79°56'W), in the Chilla range (*c.*03°33'S, 79°15'W), in the Sozoranga range (especially near Utuana (04°22'S, 79°42'W), and near Uritusinga (*c.*04°06'S, 79°09'W) (Bloch *et al.* 1991, Williams & Tobias 1994, Best & Kessler 1995, Ridgely & Greenfield 2001).

In Peru, other areas of quite similar humid montane cloud forest exist on the west slope of the western cordillera of the Andes, south of Cerro Chinguela. The best-known such locality is Cruz Blanca (05°20'S, 79°32'W; Parker *et al.* 1985), but a few others exist south of the Porculla pass in Cajamarca. Southern forests were discussed in Koepcke (1961) and Franke (1992), and more recently the forests at the head of the Zaña Valley (which apparently possess an exceptionally rich avifauna) have been subject to ornithological investigation by teams from the University of San Marcos in Lima (Salinas *et al.* 1998, 2003).

Most such 'west-slope' forests in Ecuador, as well as Peru, were included in EBA 046 (Stattersfield *et al.* 1998), because of the occurrence of the restricted-range endemics Bearded Guan *Penelope barbata*, Purple-throated Sunangel *Heliangelus viola* and Rainbow Starfrontlet *Coeligena iris*. But in fact their avifauna is characteristically different from that of forests within EBA 046 in the main Andean chain, such as those in Podocarpus National Park in Ecuador. For one, the total number of species occurring in west-slope forests is fewer, usually lacking otherwise characteristic birds such as tinamous, jays, mountain-tanagers, toucans, caciques and fruiteaters. The difference is highlighted in a limited comparison between several 'isolated' and 'main Andean chain' forests in EBA 046, in Appendix 2.

Perhaps more notable is the occurrence of a number of endemic taxa characteristic of the highlands of EBA 045 in these EBA 046 forests. Examples include the local form of Rusty-breasted Antpitta *Grallaricula ferrugineipectus*, Line-cheeked Spinetail *Cranioleuca antisiensis*, Rufous-necked Foliage-gleaner *Syndactyla ruficollis*, Chapman's Antshrike *Thamnophilus zarumae*, Loja Tyrannulet *Zimmerius* (*chrysops*) *flavidifrons*, Three-banded Warbler *Basileuterus trifasciatus*, Piura Hemispingus *Hemispingus piurae* and Black-cowled Saltator *Saltator nigriceps*.

These striking differences are easily appreciated when one travels the short distance from Ayabaca across the Calvas–Quiróz watershed. During our relatively brief forays to Aypate and El Toldo we readily found *c.*20 species that have so far never been encountered in Bosque de Cuyas. In Huamba another 20 species have been noted that do not reach Bosque de Cuyas (Schjellerup 2000). Conversely, several species were encountered in Bosque de Cuyas but not at the other two locations, or in Huamba. For now, we cannot exclude that these differences are not the result of undersampling, given that Bosque de Cuyas has been subject to relatively far greater ornithological investigation. Still, we note that some of the common Tumbesian endemic taxa of Bosque the Cuyas are at least much scarcer or perhaps absent at Aypate, El Toldo and Huamba, e.g. *Hemispingus piurae*, *Zimmerius (chrysops) flavidifrons*, *Thamnophilus zarumae*, *Syndactyla ruficollis* and *Basileuterus trifasciatus*.

The total area of EBA 046 is estimated at 10,000 km^2 (Stattersfield *et al.* 1998). Regarding total forest cover in the area, Best *et al.* (1993) stated (with some caveats) that 'humid to very humid montane cloud forest' is 'found throughout south-west Ecuador above 2,000 m'. However forests *away* from the main Andean chain, as discussed above, are actually quite rare: Gonzanamá: 'only a tiny fragment [a few ha] of heavily disturbed, mainly secondary forest remaining'; Uritusinga: 'one patch of relatively good forest' (a few km^2); Sozoranga: 'the small and isolated mountain top of Jatunpampa', 'only small forest patches left'; the Celica range: two localities mentioned, one of 400 ha, the other of 300 ha. In Ridgely & Greenfield (2001) the area of remnant forest and woodland near Utuana is specifically mentioned as being of great importance. Part of the Utuana forest is currently protected, with as much as 1,000 ha targeted for future conservation by the Arcoiris and Jocotoco foundations.

In Ridgely & Greenfield (2001) the distinctive character and avifauna of these montane west-slope forests and their peculiar conservation situation were highlighted, by splitting the Tumbesian EBA (045) into lowland ('Tumbesian lowlands') and highland ('Southwestern highlands') sectors. It was stated that such 'separation' might also prove useful in Peru. This indeed seems to be true. Including the very similar Peruvian forests within the 'Tumbesian highlands' might well be more appropriate.

It is clear from a comparison of a number of such Tumbesian highland forests (Appendix 2) that Bosque de Cuyas is of conservation importance. Fourteen distinctive, range-restricted taxa have been recorded there. Three globally threatened species occur (all listed as Vulnerable in BirdLife International 2000): Bearded Guan, Grey-headed Antbird and Rufous-necked Foliage-Gleaner, and it is certainly important for the guan and foliage-gleaner. Additionally, the occurrence of Stygian Owl and the local form of Rusty-breasted Antpitta is notable.

The forests near El Toldo and Aypate are also interesting from a conservation standpoint, in particular given the presence of two Near-Threatened species: Grey-breasted Mountain-toucan and Masked Saltator (BirdLife International 2000).

Other forests of ornithological and conservation importance undoubtedly await discovery in Ayabaca province. Several, possibly similar to that above El Toldo, were indeed noticed from a distance during our field work. Conceivably, remnants of forest similar to Bosque de Cuyas may persist on the slopes above Frías. Furthermore, humid forests at lower elevations might hold populations of other of the Tumbesian endemics. Whether any important lower altitude humid forest is extant in Ayabaca province or neighbouring provinces is unknown. It is most probable that, at least in the higher reaches of the Cerros de Amotape, important populations of some Tumbesian endemics will be located. The first expedition patroned by ProAves Perú to this ornithologically uncharted territory was made in June 2000 (Whiffin & Sadgrove 2000) and, more recently, a ProAves Perú project was launched to study forests along the Loja/Ayabaca border, between Peru and Ecuador. Hopefully, the latter will provide sufficient data to more thoroughly assess the conservation importance of Ayabaca province.

In conclusion, Bosque de Cuyas is reconfirmed as an important site. That it persists so close to a major town is surprising, and every effort to protect it must be welcomed. Protecting the forest would not only secure populations of at least 14 distinctive range-restricted taxa, but also one of the largest 'Tumbesian highland' forests, a type that seems particularly in danger of disappearing.

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APPENDIX 1

Species recorded at the Bosque de Cuyas, Aypate and El Toldo, and at three similar nearby sites at comparable altitudes in Peru: Huamba (Schjellerup 2000), Cruz Blanca (Parker *et al.* 1985), and Ecuador: Utuana (N. Krabbe pers. comm.). Abbreviations used: ? = species doubtfully recorded; x? = species present, subspecies unclear; B = recorded only in Best *et al.* (1993); C = recorded only by P. Coopmans (pers. comm.); Y = around Yanchalá. Figures indicate altitudes if species was recorded at a locality but outside the altitudinal range present in Bosque de Cuyas (2,000–3,000 m).

		Bosque de Cuyas	Aypate	El Toldo	Huamba (Schjellerup 2000)	Cruz Blanca, 2,000–3,000 m (Parker *et al.* 1985)	Utuana, 2,450–2,550 m (N. Krabbe pers. comm.)
Nothoprocta pentlandii	Andean Tinamou						x
Coragyps atratus	Black Vulture	x	x	x		x	x
Cathartes aura	Turkey Vulture	x	x			x	x
Accipiter ventralis	Plain-breasted Hawk	x		x	x	x	x
Buteogallus meridionalis	Savannah Hawk	x					
Geranoaetus melanoleucus	Black-chested Buzzard-eagle	x	x			x	x
Buteo magnirostris	Roadside Hawk	x				x	x
Buteo leucorrhous	White-rumped Hawk	x				1,750	
Buteo albonotatus	Zone-tailed Hawk	x				1,750	
Buteo brachyurus	Short-tailed Hawk	?					x
Buteo polyosoma	Red-backed Hawk	x	x	x		x	x
Buteo albigula	White-throated Hawk					x	
Harpyhaliaetus solitarius	Solitary Eagle					x	
Phalcoboenus megalopterus	Mountain Caracara	x	x	x		x	
Penelope barbata	Bearded Guan	x	x	x	x	x	
Columba fasciata	Band-tailed Pigeon	x	x	x	x	x	x
Zenaida auriculata	Eared Dove	x	Y				x
Columbina cruziana	Croaking Ground-dove		Y				
Leptotila ochraceiventris	Ochre-bellied Dove	?					x
Leptotila verreauxi	White-tipped Dove	x			x	x	x
Geotrygon frenata	White-throated Quail-dove	x		x		x	x
Aratinga erythrogenys	Red-masked Parakeet	?	?				x
Aratinga wagleri	Scarlet-fronted Parakeet	?	?			x	
Bolborhynchus sp.	*Bolborhynchus* sp.					x	
Forpus coelestis	Pacific Parrotlet		Y				
Amazona mercenaria	Scaly-naped Parrot	x					
Piaya cayana	Squirrel Cuckoo	x			x	1,850	
Tapera naevia	Striped Cuckoo						x
Crotophaga sulcirostris	Groove-billed Ani	x	Y			1,850	
Tyto alba	Barn Owl					x	
Otus roboratus	West Peruvian Screech-owl						x
Otus albogularis	White-throated Screech-owl	x		x	x	x	

Glaucidium jardinii	Andean Pygmy-owl			x	x	x	
Asio stygius	Stygian Owl	x					
Aegolius harrisii	Buff-fronted Owl				x	1,750	
Lurocalis rufiventris	Rufous-bellied Nighthawk	x		?			
Nyctidromus albicollis	Pauraque	x	x			x	
Caprimulgus longirostris	Band-winged Nightjar	x		x		x	
Streptoprocne zonaris	White-collared Swift	x	x			x	x
Cypseloides rutilus	Chestnut-collared Swift	x					
Aeronautes montivagus	Andean Swift					x	
Colibri thalassinus	Green Violetear	x				x	x
Colibri coruscans	Sparkling Violetear	x		x	x	x	x
Amazilia sp.	hummingbird sp.		Y				
Adelomyia melanogenys	Speckled Hummingbird	x	x	x	x	x	x
Aglaeactis cupripennis	Shining Sunbeam	x	x	x	x	x	
Lafresnaya lafresnayi	Mountain Velvetbreast	x	x	x		x	x
Coeligena iris	Rainbow Starfrontlet	x	x	x	x	x	x
Ensifera ensifera	Sword-billed Hummingbird	x			x		
Heliangelus micraster	Little Sunangel				x		
Heliangelus viola	Purple-throated Sunangel	x	x	x	x	x	x
Lesbia nuna	Green-tailed Trainbearer	x	x	x		x	x
Lesbia victoriae	Black-tailed Trainbearer					x	
Thaumastura cora	Peruvian Sheartail						x
Metallura tyrianthina	Tyrian Metaltail		x	x	x	x	
Myrtis fannyi	Purple-collared Woodstar						x
Acestrura mulsant	White-bellied Woodstar	x		?		x	
Pharomachrus auriceps	Golden-headed Quetzal	x	x	x		x	x
Trogon personatus	Masked Trogon		x	x	x	x	
Andigena hypoglauca	Grey-breasted Mountain-toucan		x	x			
Picumnus sclateri	Ecuadorian Piculet	x					
Veniliornis fumigatus	Smoky-brown Woodpecker	x	x	x	x	x	
Piculus rubiginosus	Golden-olive Woodpecker		Y				
Piculus rivolii	Crimson-mantled Woodpecker	x	x	x	x	x	x
Campephilus pollens	Powerful Woodpecker	x					
Lepidocolaptes affinis	Spot-crowned Woodcreeper	x		x	x	x	
Furnarius cinnamomeus	Pacific Hornero	x	Y				
Synallaxis azarae	Azara's Spinetail	x	x	x	x	x	x
Hellmayrea gularis	White-browed Spinetail						x
Cranioleuca antisiensis	Line-cheeked Spinetail	x	x	x	x	x	x
Margarornis squamiger	Pearled Treerunner	x	x	x	x	x	?
Pseudocolaptes boissonneautii	Streaked Tuftedcheek	x	x	x	x	x	x
Syndactyla ruficollis	Rufous-necked Foliage-gleaner	x				x	x
Xiphocolaptes promeropirhynchus	Strong-billed Woodcreeper						x
Lepidocolaptes lacrymiger	Montane Woodcreeper						x
Thamnophilus zarumae	Chapman's Antshrike	x	Y				x
Myrmeciza griseiceps	Grey-headed Antbird	x				x	x
Grallaria squamigera	Undulated Antpitta	C				x	x
Grallaria guatimalensis	Scaled Antpitta	C					x
Grallaria ruficapilla	Chestnut-crowned Antpitta	x	x	x	x	x	x
Grallaria watkinsi	Watkins's Antpitta						x
Grallaria quitensis	Tawny Antpitta				x	3,050+	
Grallaria rufula (*cajamarcensis*)	Rufous Antpitta					x?	

Grallaricula ferrugineipectus leymebambae	Rusty-breasted Antpitta	x?				x?	x?
Myornis senilis	Ash-coloured Tapaculo		x			x	x
Scytalopus latrans subcinereus	Blackish Tapaculo	x	x	x	x	x?	x
Phyllomyias nigrocapillus	Black-capped Tyrannulet				x	x	
Phyllomyias uropygialis	Tawny-rumped Tyrannulet	x	x	x			x
Zimmerius (chrysops) flavidifrons	Loja Tyrannulet	x				x?	x
Elaenia obscura	Highland Elaenia	x		x			
Elaenia albiceps	White-crested Elaenia	x				x	x
Elaenia pallatangae	Sierran Elaenia				x	x	x
Mecocerculus stictopterus	White-banded Tyrannulet	x	x	x	x	x	x
Mecocerculus poecilocercus	White-tailed Tyrannulet	x	x			x	x
Mecocerculus leucophrys	White-throated Tyrannulet				x	x	
Mecocerculus calopterus	Rufous-winged Tyrannulet						s
Anairetes parulus	Tufted Tit-tyrant			x	x	x	x
Anairetes nigrocristatus	Black-crested Tit-tyrant	x				x	x
Mionectes striaticollis	Streak-necked Flycatcher	x	x	x	x	x	x
Contopus fumigatus	Smoke-coloured Pewee	x				x	x
Poecilotriccus ruficeps	Rufous-crowned Tody-flycatcher						x
Contopus cinereus	Tropical Pewee					x	
Ochthoeca rufipectoralis	Rufous-breasted Chat-tyrant			x	x	x	x
Ochthoeca fumicolor	Brown-backed Chat-tyrant				x	3,050+	
Ochthoeca c. cinnamomeiventris	Slaty-backed Chat-tyrant			x			
Ochthoeca jelskii	Jelski's Chat-tyrant	x	x		x	x	x
Myiotheretes striaticollis	Streak-throated Bush-tyrant	x			x	x	x
Myiotheretes fumigatus	Smoky Bush Tyrant			x	x		
Attila torridus	Ochraceous Attila						x
Myiarchus tuberculifer	Dusky-capped Flycatcher	x	x	x	x	x	x
Myiodynastes chrysocephalus (minor)	Golden-crowned Flycatcher	x					
Tyrannus melancholicus	Tropical Kingbird		Y				
Pachyramphus versicolor	Barred Becard		x				
Pachyramphus albogriseus	Black-and-white Becard					x	
Ampelion rubrocristatus	Red-crested Cotinga	x	x	x	x	x	
Pipreola arcuata	Barred Fruiteater		x	x	x		
Cyanolyca turcosa	Turquoise Jay		x	x	x		
Cyclarhis gujanensis virenticeps	Rufous-browed Peppershrike	x			x	x	x
Vireo leucophrys	Brown-capped Vireo	x		x			x
Catharus fuscater	Slaty-backed Nightingale-thrush	x	x	x		1,750	x
Catharus ustulatus	Spotted Nightingale-thrush					x	
Turdus fuscater	Great Thrush	x	x	x	x	x	x
Turdus serranus	Glossy-black Thrush	x				x	x
Turdus chiguanco	Chiguanco Thrush						x
Turdus reevei	Plumbeous-backed Thrush	B				1,850	
Mimus longicaudatus	Long-tailed Mockingbird		Y				
Progne chalybea	Grey-breasted Martin	x					
Notiochelidon cyanoleuca	Blue-and-white Swallow	x				x	x
Notiochelidon murina	Brown-bellied Swallow					x	
Campylorhynchus fasciatus	Fasciated Wren	x					x
Troglodytes musculus	Southern House Wren	x				x	x
Troglodytes solstitialis	Mountain Wren	x		x	x		

Anthus bogotensis	Páramo Pipit			x		3,050+	
Parula pitiayumi	Tropical Parula					x	
Dendroica fusca	Blackburnian Warbler					x	
Myioborus miniatus	Slate-throated Whitestart	x	x			x	x
Myioborus melanocephalus	Spectacled Whitestart				x		
Basileuterus nigrocristatus	Black-crested Warbler	x	x	x	x	x	x
Basileuterus trifasciatus	Three-banded Warbler	x				x	x
Basileuterus luteoviridis	Citrine Warbler	x					
Basileuterus coronatus	Russet-crowned Warbler		x	x	x	x	
Euphonia cyanocephala	Golden-rumped Euphonia	x	x		x	x	
Euphonia laniirostris	Thick-billed Euphonia	x				x	
Conirostrum cinereum	Cinereous Conebill	x				x	
Conirostrum sitticolor	Blue-backed Conebill	C	x	x	x	x	x
Conirostrum albifrons	Capped Conebill	x					
Diglossa caerulescens	Bluish Flowerpiercer				x		
Diglossopis cyanea	Masked Flowerpiercer	x	x	x	x	x	x
Diglossa humeralis	Black Flowerpiercer	x		x	x	x	x
Diglossa albilatera	White-sided Flowerpiercer	x				x	x
Diglossa sittoides	Rusty Flowerpiercer	x					
Pipraeidea melanonota	Fawn-breasted Tanager		x				
Tangara vassorii	Blue-and-black Tanager	x	x	x	x	x	x
Tangara viridicollis	Silver-backed Tanager	x	x	x	x	x	x
Anisognathus lacrymosus	Lacrimose Mountain-tanager		x	x	x	x	
Dubusia taeniata	Buff-breasted Mountain-tanager					x	
Thraupis episcopus	Blue-grey Tanager		Y				
Thraupis cyanocephala	Blue-capped Tanager	x	x	x	x	x	x
Piranga flava	Hepatic Tanager	x			x	x	x
Thlypopsis ornata	Rufous-chested Tanager	x				x	x
Hemispingus superciliaris	Superciliaried Hemispingus		x	x	x	x	
Hemispingus verticalis	Black-headed Hemispingus				x		
Hemispingus (melanotis) piurae	Piura Hemispingus	x				x	x
Saltator nigriceps	Black-cowled Saltator	x	Y			x	x
Saltator cinctus	Masked Saltator			x	x		
Catamblyrhynchus diadema	Plushcap				x		x
Pheucticus chrysogaster	Southern Yellow Grosbeak	B				x	x
Sporophila luctuosa	Black-and-white Seedeater	x	x				x
Amaurospiza concolor	Blue Seedeater						x
Catamenia inornata	Plain-coloured Seedeater			x		x	
Sicalis flaveola	Saffron Finch		Y				
Phrygilus plebejus ocularis	Ash-breasted Sierra-finch	x	Y				
Phrygilus alaudinus	Band-tailed Sierra-finch					x	
Haplospiza rustica	Slaty Finch					x	
Atlapetes leucopterus	White-winged Brush-finch						x
Atlapetes latinuchus (comptus)	Rufous-naped Brush-finch	x?	x?	x?	x?	x?	
Atlapetes seebohmi	Bay-crowned Brush-finch		x				x
Buarremon torquatus nigrifrons	Stripe-headed Brush-finch	x				x?	x
Zonotrichia capensis	Rufous-collared Sparrow	x	x	x	x	x	x
Dives warscewiczi	Scrub Blackbird		Y				
Carduelis magellanica	Hooded Siskin	x				x	x
Carduelis psaltria	Lesser Goldfinch						x

APPENDIX 2

Comparison of some EBA 046 forests. Abbreviations: ? = species doubtfully recorded; x? = species present, subspecies unclear; VU = Vulnerable (BirdLife International 2000); NT = Near Threatened (BirdLife International 2000).

	Ayabaca	Cruz Blanca (Parker *et al.* 1985)	Utuana (N. Krabbe pers. comm.)	Huamba (Schjellerup 2000)	Amaluza (Williams & Tobias 1994)	Aypate	El Toldo
Range-restricted taxa							
Penelope barbata VU	x	x		x	x	x	x
Coeligena iris	x	x	x	x	x	x	x
Heliangelus viola	x	x	x	x	x	x	x
Heliangelus micraster				x	x?		
Amazilia amazilia (*alticola*?)						?	
Cranioleuca antisiensis	x	x	x	x	x	x	x
Myrmeciza griseiceps VU	x	x					
Syndactyla ruficollis VU	x	x			x		
Leptotila ochraceiventris	?		x				
Hemispingus piurae	x	x?	x				
Zimmerius (*chrysops*) *flavidifrons*	x	x?	x	x?			
Atlapetes seebohmi			x		x	x	
Basileuterus trifasciatus	x	x	x		x		
Thamnophilus zarumae	x		x		x	x	
Picumnus sclateri	x						
Turdus reevei	?	x			x		
Saltator nigrifrons	x	x	x		x	x	
Scytalopus latrans subcinereus	x	x	x	x?	x?	x	x
Aratinga erythrogenys	?		x				
Grallaria rufula cajamarcensis		x					
Grallaricula ferrugineipectus	x?	x?	x?				
Number of range-restricted taxa	14	14	13	7	12	8	5
Examples of easily recorded main-chain characteristic species							
Cyanocorax turcosa				x	x	x	x
Anisognathus lacrymosus		x		x	x	x	x
Pipreola arcuata				x	x	x	x
Cacicus holosericeus					x		
Andigena hypoglauca					x	x	x

Detecting errors in biodiversity data based on collectors' itineraries

by A. Townsend Peterson, Adolfo G. Navarro-Sigüenza & Ricardo Scachetti Pereira

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Museum curators have long checked the veracity of specimen data via collectors' field notes, thus establishing whether a particular specimen could have been collected at the claimed place and/or date. In fact, at least one institution (Museum of Vertebrate Zoology, Berkeley, California) invests heavily in its archive of collectors' field notes and has dedicated enormous effort to make this information increasingly useful (http://elib.cs.berkeley.edu/mvz/). This source of confirmatory tests of veracity of specimen data, however, would seem at first glance to be available only when detailed (and honest) field notes, journals and catalogues are available.

The idea of checking itinerary information, however, can take on a new relevance with the development of large biodiversity datasets. The example upon which the analyses developed herein are based is that of the birds of Mexico, a databasing project that has covered the Mexican bird holdings of essentially all relevant natural history museums (Peterson *et al.* 1998). This example, however, is increasingly relevant in general: as large biodiversity datasets are assembled from widely distributed sources, such detailed, multi-institutional information will become available for many taxa and regions (e.g., Species Analyst, http://speciesanalyst.net; Red Mundial de la Información de la Biodiversidad http://www.conabio.gob.mx).

The purpose of this contribution is thus, to develop the framework of a methodology for identifying potential errors in geo-referencing or in the date of collection of specimens by particular collectors. The general approach is that of assembling all of the specimens collected from a particular collector in temporal order, and imposing criteria of maximum radii of likely movement within a day, or over small numbers of days. Although preliminary, and requiring customisation for particular applications, the approach is developed and tested on five Mexican bird collectors.

Methods

Data from 33 core natural history museums in North America and Europe were used in the development of this example. This dataset (*c*.400,000 records) (Peterson *et al.* 1998) was queried for all specimens of each collector, and the top four collectors in terms of productivity were chosen for analysis (Chester C. Lamb, collecting 1920–1969, 41,184 specimens; Wilmot W. Brown, collecting 1890–1953, 18,238 specimens; Mario del Toro Áviles, collecting 1926–1958, 8,744 specimens; A. R.

Phillips, collecting 1923–1989, 7,148 specimens). All of these collectors are now deceased and all were sufficiently productive (Fig. 1) in terms of number of specimens to provide adequate samples for analysis. We also included the 1,458 specimens collected by one of us (AGNS) as an example of specimens for which data were assembled with great care. Specimen collection localities were assigned geographic coordinates based on visual inspection of 1:50,000 topographic maps; specimens for which precise geo-referencing was not possible were excluded from analyses. Records were filtered to keep only those for which both dates and geo-references were available, leaving 40,114 (Lamb), 17,809 (Brown), 7,051 (del Toro Áviles), 6,887 (Phillips) and 1,456 (AGNS) (Fig. 1).

Records of each collector were assembled in Microsoft Excel worksheets and sorted in order of date, and within dates by longitude and then latitude (ideally, localities should have been sorted by geographic proximity, but this was not done for computational simplicity). Distances (km) between one locality (lat1, long1) and the next (lat2, long2) were calculated from the spherical trigonometry formula:

$$\text{Distance} = 6378 \cdot ACOS\left[\begin{array}{l} SIN(lat1/57.2958) \cdot SIN(lat2/57.2958) + \\ COS(lat1/57.2958) \cdot COS(lat2/57.2958) \cdot \\ COS((long2/57.2958) - (long1/57.2958)) \end{array}\right]$$

(drawn from http://www.auslig.gov.au/geodesy/datums/distance.htm).

Criteria for identifying potential errors were chosen using a set of assumptions regarding the ability of collectors to move particular distances within particular time intervals. For purposes of demonstration, we used 40 km moved in a single day, 100 km moved from one day to the next, 200 km moved in two days, and 500 km moved in three days as a set of assumptions. These criteria were chosen arbitrarily to represent distances greater than the maximum distances that collectors typically move in particular time intervals. Clearly, if this methodology were to be implemented more broadly, these assumptions could be varied to match particular collectors: collectors moving on horseback could be assigned shorter distance criteria than collectors moving by automobile on more modern roads.

Crude potential errors were summarised as number per 1,000 specimens for which a potential problem was detected (i.e., number of potential errors identified per number of specimens collected on the same day as another specimen, on the day after another specimen, etc.). For a subset of records (Phillips' specimens only), records identified as potential problems were categorised, by laborious visual inspection, into those situations that were most likely to be correct (e.g., collector collected one specimen in one site, and then moved 62 km to another site, and collected more specimens), versus those that were more likely to be erroneous, and into an estimate of actual number of possible errors (e.g., if two sites 1,000 km apart

TABLE 1

	AGNS		Brown		Lamb		Phillips		del Toro Áviles	
Days	No. specimens analysed	No. potential errors	No. specimens analysed	No. potential errors	No. specimens analysed	No. potential errors	No. specimens analysed	No. potential errors	No. specimens analysed	No. potential errors
0	1,220	2	13,551	209	34,346	730	4,586	480	5,079	181
1	154	2	2,365	113	4,339	553	1,147	385	1,316	160
2	11	1	774	23	464	101	305	100	186	15
3	1	0	321	5	165	35	45	23	71	2
0-error	0.0016		0.0154		0.0213		0.1047		0.0357	
1-error	0.0130		0.0478		0.1274		0.3357		0.1216	
2-error	0.0909		0.0297		0.2177		0.3279		0.0807	
3-error	0		0.0156		0.2121		0.5111		0.0282	

were reported as being sampled during seven consecutive days, one error occurred, rather than seven).

Results

The five collectors analysed herein present diverse results in terms of error detection and analysis. Specimens collected by AGNS, as a first example, held a total of five potential errors out of 1,456 specimens (Table 1). Of these specimens with potential errors, four were somewhat long-distance moves in relatively short amounts of time: for instance, after collecting for several days in the Sierra de Juárez, Oaxaca, in early November 1987, AGNS moved 127 km between 5 and 6 November, and collected one bird at La Tinaja, Veracruz (Black Vulture *Coragyps atratus*, MZFC 6395). Checking field notes for this collection indicated that this specimen was a road-kill, and was indeed collected where and when its data indicated; such was the case for one other specimen. Three specimens, however, indeed held errors of geo-referencing (Fig. 1). For example, based on his specimen label data, AGNS moved 541 km between collecting events on 19 and 20 April 1992. Inspection of his field notes indicated that he collected at Chiquihuites, Volcán Tacaná, Chiapas, on 16–19 April, and at Papales, Volcán Tacaná, Chiapas, on 20–21 April. These two localities are not 450 km apart; rather, the geographic reference for Papales proved to represent an error of 5° of longitude. In fact, the two localities are only a few km apart, signifying true errors (post-collection) in data records associated with specimens collected by AGNS.

The other four collectors—in reality the object of this study—showed higher apparent error rates (Table 1). Error rates, calculated under the different distance-time criteria, for Brown ranged 0.015–0.050 per thousand, those for del Toro Áviles 0.028–0.122, for Lamb 0.021–0.218, and for Phillips 0.105–0.511 (see Table 1). Specimens indicated as potentially erroneous revealed many clear cases of error; for example, Phillips' collections in early October 1955 were focused in Sinaloa and Nayarit (Fig. 1), including collections on 8 October 1955. However, also on 8

October 1955, a specimen of Rufous-capped Warbler *Basileuterus rufifrons* (DMNH 26575) was apparently from Acahuizotla, Guerrero, and clearly represents an impossible jump (*c.*700 km) for a single collector (Fig. 2). Each of the four collectors showed several such clear examples of error; a rough estimate of numbers of actual errors (e.g., two distant localities on the same date, etc., omitting cases in which travel by automobile would have made such distances possible) for Phillips was about 65 probable errors.

Discussion

The approaches explored herein are not new: curators and collection managers of natural history museums have long used collectors' itineraries to assess the veracity of specimen data. What is new is the implementation of these approaches in an exploratory sense, seeking to identify specimens that have high probabilities of error without prior reason to suspect problems. Beyond simple error detection, these methods offer an opportunity to begin to understand objectively the ways in which scientific collections were assembled. In this case, errors of geo-referencing or dating are identified; additional approaches focusing on other sources of error have also been identified, and error-detection tools developed (Chapman 1999). An

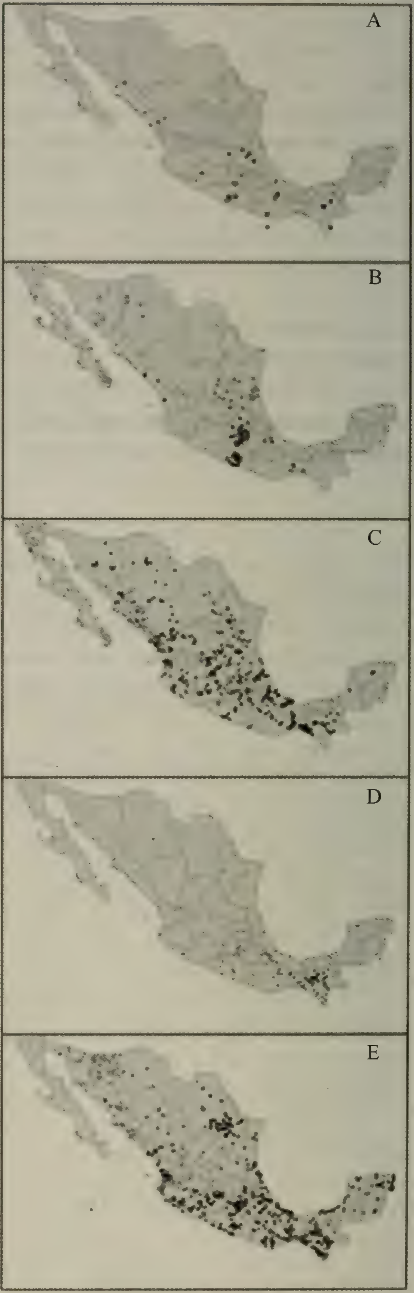

Figure 1. Maps of collecting localities for each of the five collectors analysed in this paper: (A) AGNS, (B) Brown, (C) Lamb, (D) del Toro Áviles, and (E) Phillips. The geo-referencing error detected in AGNS's specimen data is evident off the coast of Guerrero. Collecting localities are roughly classed as to year of collection by five shades from black (oldest specimens) to white (newest specimens).

important point, however, is that these methodologies are not being developed with the aim of designating particular collectors as 'good' or 'bad', but rather as a way of identifying potential problems among the data records from each collector.

Limitations

The methods explored herein can fail under three circumstances. First, the temporal density of records from a particular collector must be sufficient to permit detection of potential problems. For low-volume collectors, the probability that erroneous records would overlap sufficiently in time to allow detection of problems would be relatively low, so these methods will frequently miss problems with such collectors.

A second limitation is for situations in which specimens are listed as stemming from a single collector, but more than one collector was really involved. Examples, such as Adolphe Boucard across much of the world, are well known as listing the efforts of multiple collectors under a single name. Three of the collectors analysed herein (Brown, Lamb, del Toro Avilés) had no such arrangements. Lamb and often Phillips apparently worked with teams of collectors, although to our knowledge these teams usually remained together in groups (A. R. Phillips pers. comm. to ATP, December 1988); one possible explanation for the complications among Phillips' specimens, however, is that some of Phillips' specimens may have been acquired

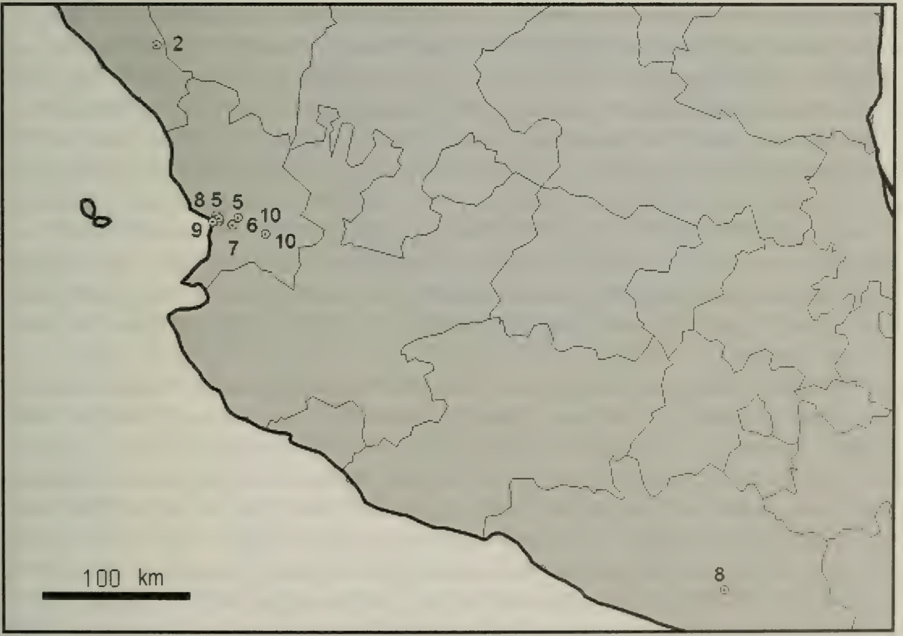

Figure 2. Map of collecting localities for Allan R. Phillips for 2–10 October 1955, showing a locality in Guerrero on 8 October 1955 that is probably erroneous.

from his collectors, who may have continued accumulating specimens (and labelled them under his name) when not in the field with Phillips. More general application of these methods must nevertheless bear in mind that such collectors who included catalogue entries from multiple collectors and preparators will often produce false indications of errors.

The final, and darkest, possibility is that of complete fabrication of data. That is, if a malicious collector simply invented everything, in this way, it would be possible to make the associated information completely consistent. This complete fabrication, rather than errors or fabrications associated with single specimens, would not be detected by the approaches developed herein.

Causes of errors detected

A diversity of factors can produce the types of errors that have been detected in this study. They range from mistakes in data recording to deliberate falsification and, of course, have very different implications as a result. Going beyond simply detecting errors then becomes important: analysis of the types and causes of errors detected permits learning about the methods and motives of each collector, and may allow detection of additional errors that could have important implications for biodiversity inventories.

Errors can be divided into two general types: collector errors and post-collection errors. Post-collection errors can enter the process at a variety of points. In older collections, such as with the Salvin and Godman collections from Mexico and Central America, specimen labels were at times prepared at the museum well after the collector's involvement (Godman 1915), creating considerable opportunity for mistakes. An excellent example of this effect is for the type specimen of the woodnymph *Thalurania luciae* (Deignan 1961), which is labelled as collected in the Tres Marias Islands off western Mexico, and described as a species new to science; in reality, it was from Brazil, its data having probably been confused between two collections arriving at the U.S. National Museum of Natural History at the same time. Numerous subsequent phases, including re-labelling, cataloguing, computerisation, and geo-referencing, provide additional opportunities for errors to come into existence.

Collector errors are perhaps more complex. Certainly, some of these problems are simple mistakes: a collector noted an incorrect date or locality on the label. Brown, according to Phillips (pers. comm. to ATP, December 1988), had an amusing source of error: labels with locality information were apparently made up prior to collection and placed in the skinning kit. If all of the pre-made labels were not used at a particular site, however, the remainder apparently stayed in the skinning kit, and would be used (accidentally) at succeeding localities. This sort of error would produce a clear signature of past, well-sampled localities appearing as scattered errors at later sites. Such a signature is indeed present in at least some Brown collections: for instance, a specimen of Olive Sparrow *Arremonops* [*rufivirgatus*] *sumichrasti* (MCZ 164687) was supposedly collected on 31 January 1931 at

Acapulco, Guerrero, when the collector was collecting numerous specimens from Coyuca, Guerrero (e.g., MCZ 163991). Acapulco, however, was sampled intensively on 9 December 1930–8 January 1931 (e.g., MCZ 163887). Nevertheless, overall, Brown's specimens appear to be relatively clean, without overwhelming numbers of errors produced by his apparent carelessness regarding labels.

A still-worse source of error is that in which labels were not prepared at the time of collection. The famous example here is that of Mario del Toro Áviles, who apparently had more than 10,000 unlabelled specimens in his house when visited by A. R. Phillips (Binford 1989). This utter lack of interest in accuracy of label information has caused numerous problems, including many odd locality and date records (Binford 1989), and even species for which the type locality is most likely inaccurate (Peterson & Nieto-Montes de Oca 1996). This pattern of collector behaviour produces the relatively numerous random locality and date records that characterise del Toro Áviles' specimens, although del Toro Áviles ranked well behind Lamb and Phillips in terms of error rates detected.

The higher error rates detected among the specimens of Lamb and Phillips are quite surprising. In both cases, the collector had been considered to be relatively reliable and no previous commentary had addressed potential problems with their material. This implication of potential problems thus demands a more in-depth, biographical analysis of these collectors.

Most difficult to manage are errors that involve deliberate falsification of data. The most famous such doings are those of the collector Richard Meinertzhagen, who apparently stole specimens, re-labelled them, and sometimes even re-prepared them to give the appearance that he had collected them himself (Knox 1993, Rasmussen & Collar 1999). As mentioned above, such broad falsification would be difficult to detect using the methodologies developed herein.

Nevertheless, errors among the specimens of Allan R. Phillips are suspicious—certainly, potential error rates associated with his specimens are higher than would have been expected, so we must consider additional information regarding Phillips' work as a collector. First, error rates among his specimens are high, indeed many times those of Mario del Toro Áviles, whom Phillips criticised so thoroughly (A. R. Phillips pers. comm. to ATP, December 1988). Second, Phillips was very concerned about specimen data, e.g., in respect of moult patterns, migration records and subspecific variation, so it seems unlikely that he would make so many random errors. Third, comments made by Phillips (pers. comm. to ATP, December 1988) regarding collecting specimens indicated that when he collected specimens during periods for which he had no collecting permits, he would change dates to those time periods for which permits were available. Finally, during museum studies as part of the assembly of the Atlas, several specimens were encountered by AGNS in Phillips' personal collection that were collected by students and staff at Universidad Nacional Autónoma de México and other Mexican institutions, including specimens collected by AGNS himself! The implications of such findings beg further information, perhaps from Phillips' colleagues and associates, which would illuminate the situation further and might permit a decision as to whether major portions of Phillips' material should be ignored in considerations of the specimen record of Mexican birds.

Implementation

Clearly, a central concern for any broad implementation of these methodologies should be the suites of assumptions regarding the ability of different collectors to move particular distances per unit time. We have, in this prototype of the method, used a 'middle-of-the-road' suite of assumptions, solely for the purposes of demonstration. Clearly, modern collectors (e.g., AGNS) could be treated differently from the former collectors (e.g., Brown), which would result in greater precision in error detection. In this sense, consideration of some biographical information regarding each collector could greatly enrich our error-detection approaches.

Tools for broad implementation of these error-detection approaches are presently under development. A first requirement is that of large quantities of biodiversity information, in which collectors' entire specimen collections are assembled. Such assemblies of information necessarily depend on integrating information from across many institutions, as most collectors' specimens are spread widely among them. Projects such as that of the Atlas of Mexican bird distributions, from which the present dataset is drawn, require intense investment in data management and for that reason there are at present few such projects (Peterson *et al.* 1998, Navarro-Siguenza *et al.* 2002). An alternative approach is that of distributed biodiversity databases, which integrate electronic databases housed at different institutions via the Internet. Nevertheless, a considerable time lag is involved in the creation of such electronic databases, particularly for methods such as this one that require complete information for full functionality.

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Rediscovery of the White-necked Picathartes *Picathartes gymnocephalus* in Ghana

by Ben D. Marks, Jason D. Weckstein, Kevin P. Johnson, Mathys J. Meyer, James Braimah & James Oppong

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The White-necked Picathartes *Picathartes gymnocephalus* is endemic to the Upper Guinean forests of West Africa (Fry *et al.* 2000) from Guinea to Ghana. Throughout this range, the rapid fragmentation and destruction of lowland rain forest threatens the survival of this remarkable species (BirdLife International 2000). Recent studies have focused on various demographic and ecological questions regarding populations of *P. gymnocephalus* in Guinea (Halleux 1994), Liberia (Allport 1991), Sierra Leone (Thompson 1993, 2001, Thompson & Fotso 2000), and Ivory Coast (Salewski *et al.* 2000). However, no recent records of this bird are available from Ghana. The most recent published records of *Picathartes* in the country are those of

Grimes (1964, Grimes & Darku 1968), the latter summarising results from a 1966 survey. Since the 1960s, attempts to locate this species in Ghana have been unsuccessful (John Mason pers. comm.). As a result, it was widely believed that *P. gymnocephalus* had been extirpated from Ghanaian forests. Here we report on the recent rediscovery of *P. gymnocephalus* in the Brong-Ahafo Region, Ghana.

On 14–30 March 2003 we conducted an avifaunal survey in a block of forest reserves in Brong-Ahafo Region. Our survey relied heavily on a line of 26 consecutively-strung mist-nets running along the boundary line between Ayum and Subim forest reserves (06°71'N, 02°73'W). The forest in this region is dominated by *Celtis* spp., *Ceiba* and *Pterogota* tree species and has many large boulders and rocky outcrops. On 26 March 2003 at 1040 h we mist-netted a *P. gymnocephalus* (Fig. 1), videotaped, photographed and released it unharmed. On 28 March 2003 we showed the video of the *Picathartes* to a local hunter in Asumura to discover whether he was familiar with the species. He immediately recognised the bird and told us that he had encountered at least three individuals in the nearby forest reserves. He reported some of the life history attributes of the species, such as breeding period (the fifth month of the year) and nest site. On 30 March he led us to a nest site. The nests were located on a boulder *c*.5 m high with a cave-like overhanging face sloping at a steep angle down to the ground. The two nests were constructed from mud and plant fibres, attached to the overhang with the cup of the nest forming a semi-circle *c*.30 cm wide, 15 cm high, and 15 cm deep. They were positioned less than 1 m apart at approximately the same height (*c*.2.5 m). On the floor of the shelter formed by the

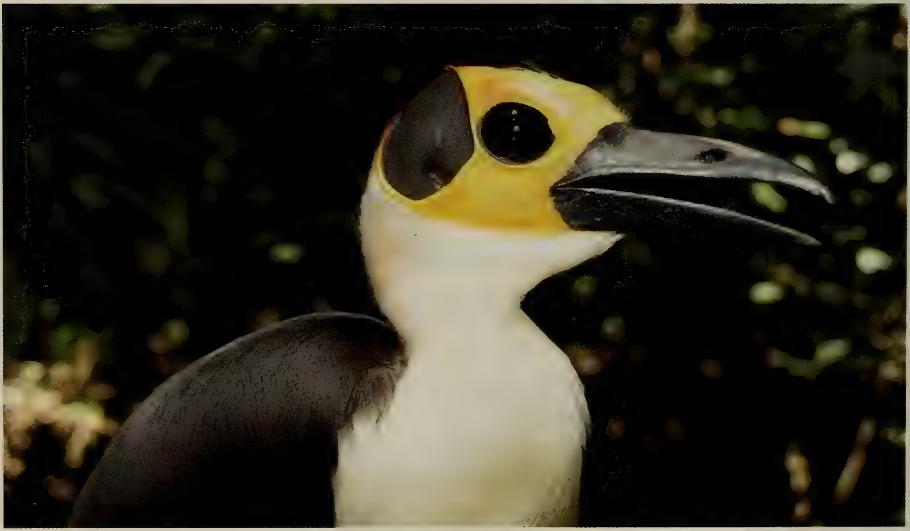

Figure 1. *Picathartes gynmochepalus* mist-netted in Ghana on 26 March 2003 (J. D. Weckstein & B. D. Marks)

over-hanging rock were several hundred snail shells; snails are a potential food source for this species (Fry *et al.* 2000). The local hunter noted that when he first found this nesting site there was only one nest and that the second nest was new. JO and the hunter revisited the nesting site on 22 April 2003 and noted that one of the nests had undergone further construction, making it 18.5 cm high. The activity at the nest site, coupled with the hunter's report of other *Picathartes* in different sites in this forest reserve system, suggest that this location may hold a viable population of *Picathartes*. The Ghana Wildlife Division, Nature Conservation Research Centre (NCRC, a Ghanaian NGO), and the Chief of Asumura are making an effort to protect the species in these reserves. Further work is needed to census the area for other individuals and nests to determine the viability of this *Picathartes* population.

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A nest of the Spot-fronted Swift *Cypseloides cherriei* in eastern Ecuador

by Harold F. Greeney

Received 20 July 2003

Among the most poorly known species in South America is the Spot-fronted Swift *Cypseloides cherriei*. Originally described from Costa Rica 110 years ago (Ridgway 1893), it was considered to be confined to a single locality there for over 50 years (Peters 1940) until specimens were reported from Colombia and Venezuela (Zimmer 1945, Beebe 1949). Whilst its range is now known to extend to both slopes of the Andes in northern Ecuador (del Hoyo *et al.* 1999, Ridgley & Greenfield 2001), its distribution is disjunct and poorly understood. Little has been reported concerning the behaviour of Spot-fronted Swift in Ecuador (but see Moore *et al.* 1999, Ridgely & Greenfield 2001, Howell 2002), and the only reports of breeding activity are from Rancho Grande in Venezuela (Collins 1980) and central Costa Rica (Marín & Stiles 1992). Here I present observations of Spot-fronted Swift in north-east Ecuador.

Observations were made at Cabañas San Isidro preserve, in Napo province, *c.*3 km west of Cosanga and adjacent to the Yanayacu Biological Station & Center for Creative Studies (00°35'S, 77°53'W). The preserve encompasses primary and disturbed forest at 2,000–2,500 m in elevation and experiences a wetter season from roughly February to July. Whilst bird watchers and ornithologists have appreciated the uniqueness of this area for nearly 20 years, little has been published about the site and ornithological studies have only recently drawn more attention to its avifauna (Greeney 2002, Dobbs *et al.* 2003, Price 2003, Greeney *et al.* 2004).

On 27 May 2002 at 1300 h an adult Spot-fronted Swift was found sitting in a seemingly completed but empty nest in the relatively level area of primary forest west of the Cosanga River at 2,050 m. The nest was within a small cave created by a pile of large boulders through which a small stream was running. Overall, the cave was *c.*3 m high at the highest point and accessible from three entrances, each *c.*1.5 m high and 1.5–2.5 m wide. The nest had been constructed on top of an old Chestnut-collared Swift *Cypseloides rutilus* nest that had successfully fledged two young the previous October (Greeney unpubl. data). It was 1.5 m above the stream, 35 cm from the top of the cave at this point, and located on an outward-curving rock face. It was slightly smaller than the remnants of the Chestnut-collared Swift nest, which created a platform to support the new nest. The nest was a shallow cup formed entirely of fresh green mosses, lichens, liverworts and pieces of ferns. Unfortunately the nest was found destroyed two weeks later and no further observations were possible.

The cave where this nest was found has been used for breeding over the past four years by Chestnut-collared Swifts (Greeney unpubl. data). This species breeds in August–January in the area, roughly corresponding to the drier months. This, and other similar nesting sites of the Chestnut-collared Swift are used as roosting sites throughout the year. The exact nest site of the Spot-fronted Swift was re-used in September–December 2002 and 2003 by a pair of Chestnut-collared Swifts. It is unknown whether Chestnut-collared Swifts were using this cave as a roost in May 2002, but no other active nests were found.

Collins (1980) noted the proximity of Spot-fronted Swift nests to those of Chestnut-collared Swift nests in Venezuela. Breeding activity for both species was recorded in the wet season in that area (Beebe & Crane 1947, Collins 1980). Chestnut-collared Swifts breed during the dry season in this area of north-east Ecuador (Greeney unpubl. data), whereas all previous studies have indicated the species to breed in the wet season (Snow 1962, Collins 1968, Marín & Stiles 1992). The nest of Spot-fronted Swift observed here was during the wet season. Work on swiftlets (Collocalia) in Indonesia suggested that species sharing roost sites used foraging times as a resource-partitioning mechanism (Medway 1962, Harrison 1974). Whilst both of the *Cypseloides* swifts discussed here are often seen foraging together in Ecuador (Howell 2002, M. Lysinger pers. comm.), and Collins (1980) suggested a similar resource-partitioning hypothesis for observations in Venezuela (Beebe 1949, Schäfer & Phelps 1954), the information presented here suggests a different ecological relationship between these congenerics in our area. My observations warrant further investigation of possible niche partitioning for these species in north-east Ecuador and point to the need for basic natural history and observational studies on these and many other Neotropical birds.

Acknowledgements

I am deeply indebted to Carmen Bustamante and Mitch Lysinger at Cabañas San Isidro, for their patience, support, and guidance. C. T. Collins and R. C. Dobbs generously provided comments and literature. Ruth Ann & John V. Moore generously provided funds to encourage my natural history observations and the PBNHS continues to provide support and assistance. This is publication number 27 of the Yanayacu Natural History Research Group.

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For details of Club Meetings see inside front cover.

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Authors are invited to submit papers on topics relating to the broad themes of taxonomy and distribution of birds. Descriptions of new species of birds are especially welcome and will be given priority to ensure rapid publication, subject to successful passage through the normal peer review procedure, and they may be accompanied by colour photographs or paintings. On submission, manuscripts, **double-spaced** and with **wide margins**, should be sent to the Editor, Guy Kirwan, preferably by e-mail, to GMKirwan@aol.com. Alternatively, **two copies** of manuscripts, typed on one side of the paper, may be submitted to the Editor, 74 Waddington Street, Norwich NR2 4JS, UK. Where appropriate half-tone photographs may be included and, where essential to illustrate important points, the Editor will consider the inclusion of colour figures (if possible, authors should obtain funding to support the inclusion of such colour illustrations).

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September 2004

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. [Limited car parking facilities can be reserved (at a special reduced charge of **£5.00**), on prior application to the Hon. Secretary].

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm.** (A vegetarian menu can be arranged if ordered at the time of booking). Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges were increased to **£19.00**, as from **1 January 2004.**

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

Tuesday 28 September—Professor Glen Chilton—*The curse of the Labrador Duck*
Glen Chilton is an Associate Professor of Biology at St Mary's College in Calgary, Canada. For the past 18 years most of his research efforts have concerned the songs of birds, particularly the evolution of songs in crowned sparrows and New World warblers. This work has taken him to some of the most remote parts of North America. He is currently on a research sabbatical in the UK. Nine years ago, while constructing the species account of the extinct Labrador Duck for the *Birds of North America* series, he became fascinated by the stories associated with this species. They are tales of murder, theft, enormous wealth and wartime crimes. Glen is now travelling the world to examine all remaining stuffed specimens, and is writing a book about his adventures.

Applications to Hon. Secretary (address below) *by* ***14 September*** *please.*

Tuesday 2 November—Robert C. Fleischer—*Hawaiian bird evolution and conservation*
Rob Fleischer began his career studying morphological evolution and population genetics in introduced populations of the House Sparrow in Kansas. He also has interests in avian brood parasitism, and the function and consequences of bird song dialects, using genetic methods to study both in Brown-headed Cowbirds. Since 1987, his primary research has been on evolutionary genetics, systematics and conservation genetics of Hawaiian birds. He and his Smithsonian Institution collaborators have conducted molecular phylogenetic analyses on many of the endemic taxa in the islands, including the radiation of Hawaiian honeycreepers. Rob has also analysed ancient DNA from subfossil bones of many of the extinct birds, such as ponderous flightless waterfowl known as 'moa nalos' and used the same methods to measure losses of genetic variation over millennia in the Nene. More recently, he has developed a programme that uses genetic and other methods to examine interactions involving an introduced mosquito vector, a devastating, invasive, avian malaria (*Plasmodium relictum*), and a host of susceptible native and largely resistant introduced birds. By understanding this complex system we may be able to develop more effective methods to control its impacts on the native birds that yet remain in the forests of Hawaii.

Applications to Hon. Secretary (address below) by ***14 October*** *please.*

Tuesday 7 December 2004—Dr A.G. (Andy) Gosler—*Eggshell maculation in Great Tit and other passerines*
Andy Gosler has worked at the Edward Grey Institute, Oxford, since late 1981 when, having recently completed an MSc in plant taxonomy, he assumed a part-time field assistant's position ringing Great Tits in Wytham Woods. The BOU's David Lack Studentship then funded his D.Phil. to study the evolution and ecology of Great Tit bills in Wytham Woods. Several important studies developed from that work. However, fascinated by the seemingly pointless patterns of pigment spots (maculation) on Great Tit eggs, in 1988 he started recording and comparing the pigment patterns on eggs produced by different females. This ongoing study is yielding fascinating insights into how finely tuned are the breeding adaptations of these. Andy has been a member of both the BOU and BOC since 1976, and since 1998 has edited *Ibis*.

Applications to Hon. Secretary (address below) by ***14 November*** *please.*

Future meetings in 2005—provisional dates for seven meetings in 2005 have been set for the following Tuesdays: 25 January, 22 March, 26 April (AGM), 7 June, 27 September, 1 November and 6 December.

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2005, giving as much advance notice as possible—please contact: Tony Statham, Woodcock Hill, Durrants Lane, Berkhamsted, Herts. HP4 3TR, UK (or e-mail: SAHS@tinyonline.co.uk).

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CLUB ANNOUNCEMENTS

2005 subscription rates: renewals

As announced in the June issue, subscription rates are to be increased with effect from 1 January 2005: **£17.50** for BOU members, **£24** for non-BOU members and **£32** for libraries and institutions. Renewal leaflets (with Bankers Standing Order Forms) are enclosed for all **Members**, and, to minimise postal delays and confusion over the Christmas period, it would be very helpful if early action could be taken to complete these NOW. Any queries to Membership Secretary (mbcasement@aol.com), please.

Libraries and Institutions will receive separate renewal instructions from Steve Dudley: bocadmin@bou.org.uk.

The 923rd meeting of the Club was held on Tuesday 27 April 2004, in the Sherfield Building Annexe, Imperial College, following the Annual General Meeting. 22 Members and 10 guests were present.

Members attending were: Dr C. F. MANN (*Chairman*), Miss H. BAKER, I. R. BISHOP, D. R. CALDER, Cdr. M. B. CASEMENT RN, Professor R. A. CHEKE, N. CLEERE, D. J. FISHER, F. M. GAUNTLETT, Rev. T. W. GLADWIN, D. GRIFFIN, J. P. HUME, J. A. JOBLING, G. M. KIRWAN, D. J. MONTIER, Mrs A. M. MOORE, Mrs M. N. MULLER, Dr R. P. PRŶS-JONES, P. J. SELLAR, S. A. H. STATHAM, N. H. F. STONE and C. W. R. STOREY.

Guests present were: Ms G. BONHAM, Mrs C. R. CASEMENT, Mrs M. H. GAUNTLETT, Mrs J. M. GLADWIN, Mrs M. MONTIER, P. J. MOORE, C. A. MULLER and Mrs S. STONE.

After dinner, a series of short talks was given by Members on subjects of topical interest; the following is a brief synopsis of the main points presented.

David Fisher spoke about the recent development of small digital cameras and their suitability for taking photographs of birds through telescopes, an activity now termed 'digiscoping', Using a PowerPoint projector, he showed a few spectacular examples of such photographs of birds from various countries around the world, and then demonstrated results from a recent trip to Brazil. He concentrated on the jacamar family (Galbulidae), showing images of seven species of jacamar, which included representatives of four of the five genera in the family. David briefly described the differences between the four genera, covering habitat, feeding behaviour and nesting, and also questioned whether *Urogalba*—the original genus of the Paradise Jacamar *Galbula dea*—should have been subsumed within *Galbula*, as that species appears to bear little resemblance to the rather typical appearance of the other nine species in the genus.

Guy Kirwan spoke on **Kaempfer's Tody-tyrant *Hemitriccus kaempferi***. This poorly known Brazilian endemic was, until very recently, known only from two specimens (illustrations of one of which were shown). It is restricted to a tiny area of south-east Brazil, principally in north-east Santa Catarina state. Following the first field observations of the bird, in 1991, Guy and his colleagues have spent time in appropriate areas searching for (and in some cases finding) the species in new areas, documenting its behaviour, including nesting, and gaining new insights into its taxonomic relationships. The results of these studies have been published in papers in *Bird Conservation International* and *Cotinga*, but there is still much to learn. Guy also showed recent field photographs of the species and one of its closest relatives, the Fork-tailed Tody-tyrant *H. furcatus*.

Nigel Cleere gave an illustrated talk on the **Cayenne Nightjar *Caprimulgus maculosus***. This is the rarest Neotropical caprimulgid, being known only from a single specimen, a male collected on 24 April 1917, by Samuel Milton Klages, at Saut Tamanoir (05°09'N, 53°45'W) on the Mana River in French Guiana. It is held in the Carnegie Museum of Natural History in Pittsburg, USA. Although not seen again since its discovery, a small number of unidentified nightjars have been observed in French Guiana in recent years. Since 1999, Nigel Cleere and Johan Ingels have searched for this elusive species at many localities within French Guiana and have made several trips to the type locality, but their efforts have so far proved fruitless. However, their journeys have not been totally unsuccessful, as they have discovered new habitat information for Blackish Nightjar *C. nigrescens*. This relatively common species occurs throughout the Guianan Plateau and Amazon Basin. Its primary habitat requirements are granite outcrops, or inselbergs, within rain forest, although it will colonise new areas by occupying clearings and dirt roads. At Saut Tamanoir, they found several pairs breeding on small rocky outcrops along the edges of the Mana River.

Tony Statham gave a presentation entitled ***Birds on Stamps***, a hobby that "meets his personal objectives of an interest in global ornithology, bird illustration and philately combining some of the marvels of nature into miniature works of art with the dimensions of geography and postal history". His talk was illustrated with several overhead transparencies showing the myriad of bird-stamp designs and selected album pages from his collection. Some of these were also mounted as a display on boards in the meeting room. Tony linked the long history of ornithology with man's portrayal of birds in art through the ages from Egyptians, Greeks and Romans to the present day. He suggested the expansion of international trade from the 16th century introduced a much wider knowledge of birds to the public and collectors patronised artists to portray their specimens in a variety of paintings. The evolution of woodcuts, lithographs, modern printing methods and photography have all led to a vast array of bird books and ultimately postage stamps. Among the first bird stamps to appear were those of Western Australia depicting the Mute Swan *Cygnus olor* in 1854 and an early Japanese stamp illustrating a goose dated 1875. There are some 20 different issues of bird stamps pre-dating 1900. Whilst ornithologists recognise in excess of 9,500 different species of birds, nearly one-third of these have been illustrated on the stamps of almost every nation in the world and it is probable that there are now in excess of 25,000 different bird stamps including extinct species such as the Dodo *Raphus cucullatus*. Tony went on to explain the predicament of whether to collect stamps by their country of origin, which is perhaps the preferred choice of philatelists, or to sort his collection into bird families. He showed examples of both approaches with a selection of penguin stamps (mostly from the Southern Hemisphere) to a selection from a single country (Afghanistan). He also highlighted that commercial opportunities have created a flood of 'miniature sheets', which could easily form a collection on their own. Many are attractive works of art in their own right, often showing birds in their natural habitat with allied plants and animals. Another derivation within the subject is the selection of stamps, which have evolved with printing errors or colour variations. Tony concluded that while the growing pressures of space made his interest in collecting bird books something of a nightmare, he could console himself with the advantages of a great art collection contained in only a few volumes of stamp albums.

Tom Gladwin expressed concerns in a short talk with the challenging title ***Biodiversity or Bitterns***. Biodiversity is of fundamental importance; globally it should be concerned with providing for the survival of the greatest number of species. Similarly, at the local level the principal objective should be to optimise the number of species occurring naturally in areas managed for nature conservation. In general, the greater the proportion of expected species occurring naturally, the greater is the stability of the communities of which they are part. Mosaics of inter-related habitats are also important to biodiversity, especially to species whose developed life cycles require access to different habitat types. In some cases, the lack of regard for these principles in seeking to increase the populations of certain high-profile species is cause for concern. Some Biodiversity Action Plans, for example, have concentrated on a catalogue of selected locally rare species with no evident regard to the ecological benefits that derive from the wider concepts of biodiversity. There are examples of mosaics being reduced to create reedbeds for the benefit of a single species, Bittern *Botaurus stellaris*. In at least one such instance semi-natural floristically rich wet grassland was converted to a reed monoculture, a habitat with a lower species index, with no prior consideration of the species that were consequentially lost from the site, resulting in a net reduction of species diversity. This is not to suggest that threatened species do not merit special attention but that provision for their conservation should be made in a wider context. Further problems could also arise when preferential management creates population imbalances within communities. Are populations of all prey species sustainable when predated by a local post-breeding population of up to 30 Marsh Harriers *Circus aeruginosus* at a single Suffolk location? What is the future, and impact on other species, of over 300 Red Kites *Milvus milvus* concentrated in a small area along the borders of Oxfordshire? There are also concerns about the prioritisation of limited resources. Might the efforts to establish Ospreys *Pandion haliaetus*, by no measure a threatened species, in Rutland be better directed? Given say £2 million for nature conservation should it be spent on a single species, e.g. Bittern, or more soundly on raising the biological carrying capacity of the wider countryside? These questions merit a wide-ranging debate.

Julian Hume gave an illustrated talk on ***The mystery of the Mascarene parrot***. A diverse parrot fauna once inhabited the Mascarenes but sadly, within a short period of human colonisation, all bar the Echo Parakeet *Psittacula echo* of Mauritius had become extinct. Extinct Mascarene parrots are generally poorly represented in the fossil record; only two are known from skins, and most by inadequate contemporary accounts and illustrations. Only one species, the Mascarin *Mascarinus mascarinus*, endemic to Réunion, is seemingly well known. However, even with this species, a mire of erroneous assumptions has accumulated concerning coloration, extinction date and affinities. During 1671–72, the most important observer of Réunion avifauna, Dubois, noted a chicken-sized *grey* parrot with black face mask and red bill—the first time the Mascarene parrot was described; it was last reported on Réunion in the 1770s. At least three specimens arrived in Paris, described by Brisson in 1760 as a *grey* parrot, followed by Buffon some 20 years later, who described it as brown. The bird was also illustrated a number of times, the first by Martinet for Buffon's *planches enluminées*, where Martinet depicted a brown bird with bluish-lilac head—a coloration that has become the orthodox image today. The brown is almost certainly an artefact of aging/exposure to light or, as no mechanical means were available to reproduce colour, an original Martinet template was copied *en masse* by unskilled labour and thus open to variation. Martinet's illustration provided the basis for most Mascarin renditions: an unreliable source to begin with. The extinction date of the Mascarin stems from the work of the German ornithologist Hahn, who stated that the last living individual resided in the King of Bavaria's menagerie in 1834, yet Hahn's Mascarin illustration was a direct copy of Martinet's plate. Furthermore, the menagerie was auctioned in 1826 and an earlier inventory lists all species in precise detail and makes no mention of the Mascarin. Hahn further described the Mascarin as 'not very lively' and one can only compare this scenario with Monty Python's dead parrot sketch—whatever Hahn had observed had 'already met its maker.' The date of extinction is, therefore, unfounded and it probably became extinct before 1800. The affinities of this aberrant parrot have been open to debate. Fossil evidence is rare and further complicated by the fact that X-rays of the Paris specimen revealed that the skull had been removed, and its whereabouts are unknown. Comparative analysis, however, indicates that it is derived from the south-east Asian Psittaculini.

Diana Bradley had contributed a quiz listing poets and bird names featuring in literature. This proved both interesting and testing, and answers were given at the end of the meeting.

Corrigendum: Orthography of the name *Xenopirostris damii*

In *Bull. Brit. Orn. Cl.* 124: 69, the authorship of this taxon is represented as '*Xenopirostris damii* (Schlegel, 1866)'. However, as Schlegel described this species in *Xenopirostris*, the parentheses are inappropriate. The year in which this taxon was described is somewhat controversial, and it appears that the correct date may have been 1865. Further details can be located at http://www.zoonomen.net. I am grateful to Alan Peterson for drawing this matter to my attention. *Ed.*

A new hawk-owl from the Togian Islands, Gulf of Tomini, central Sulawesi, Indonesia

by M. Indrawan & S. Somadikarta

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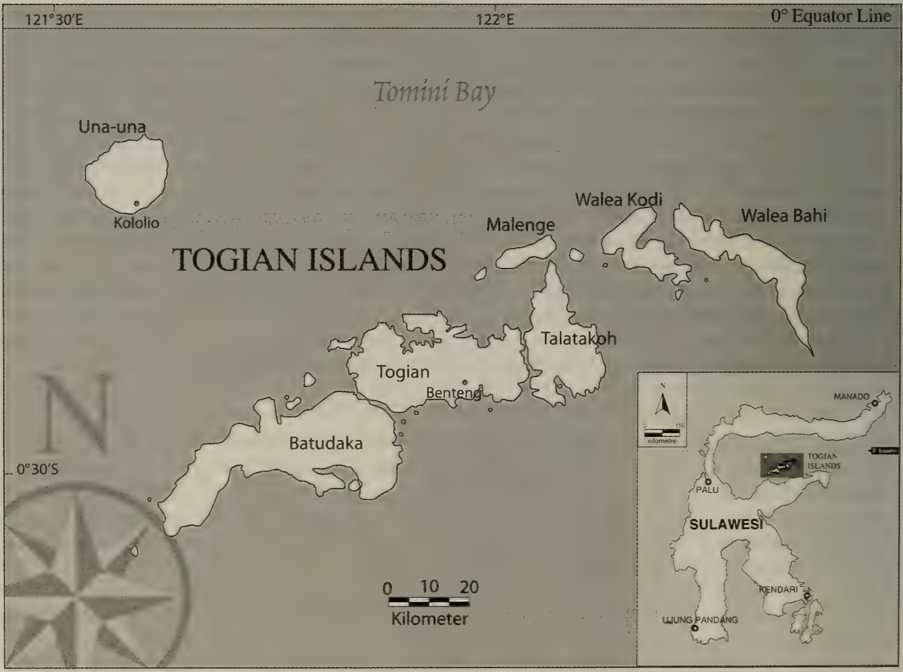
The Togian Islands in the Gulf of Tomini, central Sulawesi, Indonesia (Fig. 1) are small islands, of which *c*.25% is covered by lowland forest. The archipelago is separated from central Sulawesi by largely shallow water, in places less than 200 m deep. Ornithological explorations have recently been mounted to the group (Indrawan *et al*. unpubl.), but no endemic bird species were previously known. The avifauna of Sulawesi includes two species of barn owls (Tytonidae) and four typical owls (Strigidae). The former family is represented in Sulawesi by the endemic Minahassa Masked-owl *Tyto inexspectata* and Sulawesi Owl *T. rosenbergii*, which is endemic to Wallacea. The four other owls of mainland Sulawesi are: the northern winter visitor, Brown Hawk-owl *Ninox scutulata*, and three Sulawesi endemics, Sulawesi Scops-owl *Otus manadensis*, Ochre-bellied Hawk-owl *Ninox ochracea* and the recently discovered Cinnabar Hawk-owl *N. ios* (Rasmussen 1999, Lee & Riley 2001).


121°30'E
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0° Equator Line
Tomini Bay
Una-una
Kololio
TOGIAN ISLANDS
Malenge
Walea Kodi
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Benteng
Batudaka
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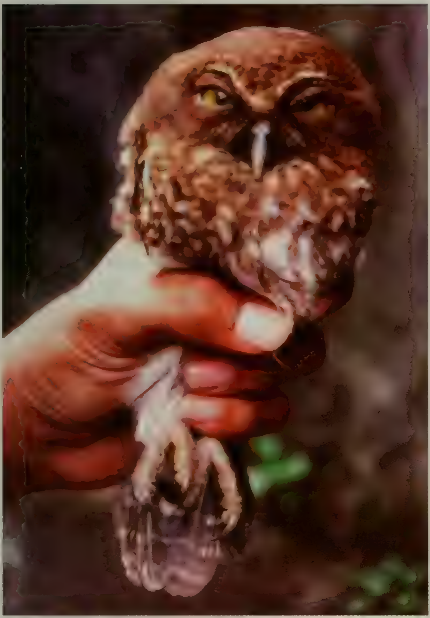
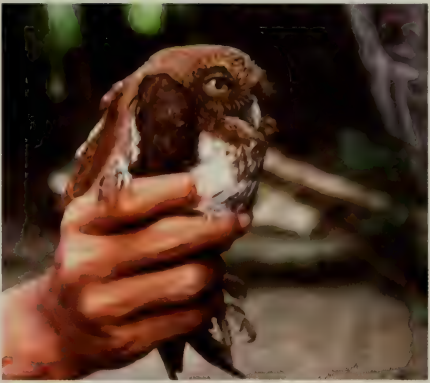
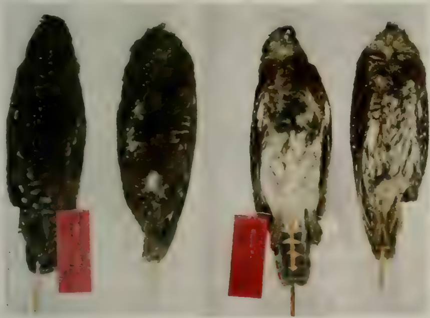
MANADO
TOGIAN ISLANDS
PALU
SULAWESI
KENDARI
UJUNG PANDANG

Figure 1. Map of the Togian Islands.





Figures 2–3 (above and top right). Live Togian Hawk-owl *Ninox burhani*, Togian Islands, 13 April 2001 (M. Indrawan)



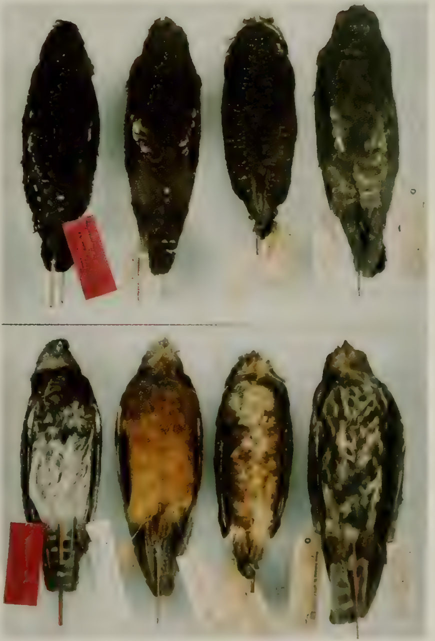


Figure 4 (bottom left). Dorsal and ventral views of the holotype and paratype of Togian Hawk-owl *Ninox burhani* (Mr Arief)

Figure 5 (bottom right). Dorsal and ventral views of, from left to right, Togian Hawk-owl *Ninox burhani* (holotype), Ochre-bellied Hawk-owl *N. ochracea,* Speckled Hawk-owl *N. punctulata* and Brown Hawk-owl *N. scutulata*. Note that Barking Owl *N. connivens* was not included because of its disproportionately large size (Mr Arief)

Prior to the present study, no owls were listed for the archipelago, despite its relative proximity to the mainland (Meyer 1879, Meyer & Wiglesworth 1898, Peters 1940, Stresemann 1940, Ripley 1941, White & Bruce 1986, Owen *et al.* 1987, Sibley & Monroe 1990, Coates & Bishop 1997, Holt *et al.* 1999, König *et al.* 1999). Although the Togian Islands had previously been explored by our research group (Indrawan *et al.* unpubl.), no sightings or aural records had been made of any owl, and thus we did not expect to find any owls in the islands. However, unidentified owl vocalisations were heard on the night of 25 December 1999, whose source was searched for, resulting in the observation of three birds (see Observations), which we now know to belong to an undescribed species. The new species was discovered during the first visit to Benteng, a village with gardens and surrounded by lowland forest.

Here we describe a new species of hawk-owl and provide new records of typical owls for the Togian archipelago, based initially on field observations and, thereafter, two specimens collected for and housed at the Museum Zoologicum Bogoriense (MZB), Cibinong, near Bogor, Indonesia. Colour matching was performed under natural light using Smithe (1975) colour swatches.

Ninox burhani sp. nov. Togian Hawk-Owl

Holotype. MZB 30.365, adult male, collected in scrubby forest below 100 m a.s.l., at Benteng village, Togian Island, Togian archipelago, Gulf of Tomini, central Sulawesi, Indonesia, by R. M. Hidayat with the assistance of Burhan and Iling Taskir, on 8 April 2001 (Fig. 4.).

Paratype. MZB 30.366, adult male, collected in sago swamp at Baulu village, Togian Island, Togian archipelago, at sea level, by M. Indrawan with the assistance of Nasution and Akim, on 26 March 2002 (see Fig. 4).

Measurements and weight of the holotype (in mm; weight in g). Wing (chord) 183.5, tail 98.0, culmen 22.5, tarsus 29.0, weight (post mortem) 100 g (Table 1).

Specimens examined (including the holotype). Two males collected from Benteng and Baulu villages, Togian Island, Togian archipelago, Gulf of Tomini, central Sulawesi, Indonesia.

Description of the holotype. Plumage fresh (Fig. 4), the front of the head, crown, back and streaks on the breast approach Mars Brown (223A) and Verona Brown (223B). The face has a prominent pattern, with pale or Tawny Olive (223D) supercilia, pronounced fine barring on the crown and nape to upper mantle, coloured Sayal Brown (223C). Abdomen white with Raw Umber (223) shafts. Flight feathers spotted, alternating between white and pale Tawny Olive (223D). Wings have triangular white spots on the primaries. The relatively long tail is between Dark Greyish Brown (20) and Fuscous (21), and prominently banded with paler narrow bars of Tawny Olive (223D). Irides, based on photographic compari-

TABLE 1

Measurements (in mm) of wing, shortfalls (distance of tip of each primary from the longest primary), tail, pale and dark tail bars (width), culmen and tarsus, and weight (g) of *Ninox burhani* sp. nov., *N. ios* and *N. ochracea*.

	Ninox burhani	*Ninox burhani*	*Ninox ios**	*Ninox ochracea*	*Ninox ochracea*	*Ninox ochracea*
	MZB 30365	MZB 30366	RMNH 84701	MZB 5422	MZB 17713	MZB 17714
	% &	%	%	%	&	%
Characters						
Wing	183.5	183.0	172.0	183.5	183.5	179.0 m
Shortfalls:						
P1	52.0	nm	53.0	49.0	55.0	m
P2	22.0	nm	16.0	17.0	19.0	m
P3	6.0	nm	2.0	2.0	5.0	5.0
P4	0	nm	0	0	0	0
P5	2.0	nm	2.0	0	0	4 m
P6	8.0	nm	11.0	10.0	7.0	9.0
P7	21.0	nm	21.0	22.0	20.0	21.0
P8	35.0	nm	33.0	31.0	31,5	34.0
P9	43.0	nm	39.0	46.0	44.0	45.0
P10	51.0	nm	47.0	51.0	49.0	51.0
Tail	98.0	98.0	97.0	103.0	109.0	101.0
Tail bars:						
Pale	2.0	3.0	4.0**	2.0	2.0	2.0
Dark	9.5	7.5	3.0**	9.0	8.0	7.0
Culmen	22.5	23.0	17.9	24.0	23.0	23.0
Tarsus	29.0	29.0	22.6	30.0	28.0	–
Weight (g)	100†	98†	78	–	–	–

Notes: * = data from Rasmussen (1999); ** = measured by R. W. R. J. Dekker (Nationaal Natuurhistorisch Museum, Leiden [RMNH]) of bars approximately in the middle of the tail; m = moult; † = post-mortem weight; nm = not measured (primaries worn, the first and second primaries missing through moult). MZB 5422: male, collected on Buton Island, by Mohari, in 1910; MZB 17713: female, collected at Tonsea-lama, Tondano, Manado, by J. A. v. Braekel, no date; MZB 17714: male, collected from Bumbulan, Celebes, by J. J. Menden, on 30 October 1939.

son, Orange Yellow (18), and bill paler than Cream (54) with a darker greyish base. Rictal bristles blackish, but the basal half is Mars Brown (223A). Tarsi relatively slender and, like the toes, unfeathered but bristled. Summary information on plumage coloration is presented in Table 2, and the range of variation observed in the field provided in the Observations section.

Diagnosis. Differences between *Ninox burhani* and its three congeners (Ochre-bellied Hawk-owl *N. ochracea*, Speckled Hawk-owl *N. punctulata* and Brown Hawk-owl *N. scutulata*) are readily observed (Fig. 5, which does not include *N. ios*, as MZB lacks specimens of this species, or Barking Owl *N. connivens*, which is much larger than the other four).

The new species is medium-sized, brown hawk-owl, with white lower underparts, from the lower breast to the vent, streaked with brown. Like most typical owls, but unlike Cinnabar Hawk-owl (Rasmussen 1999), the face has prominent supercilia, which may meet above the nasal area. In the hand, the crown and nape are heavily barred. Flight feathers marked with white and pale spots. Cinnabar Hawk-owl (specimens from Gunung Ambang, northern Sulawesi) is bright rufous and lacks supercilia or spotted flight feathers (Rasmussen 1999), both of which are present in Togian Hawk-owl.

The spotted flight feathers are shared with Ochre-bellied Hawk-owl (one specimen, from Buton Island, south-east Sulawesi), although the spots are perhaps slightly larger in Togian Hawk-owl. The upperparts of Ochre-bellied Hawk-owl are similar to those of Togian Hawk-owl, between Mars Brown (223A) and Verona Brown (223B), although the latter species is perhaps marginally darker brown, with distinct fine pale barring on the nape to upper mantle. The barred tail is more pronouncedly so in Togian Hawk-owl, but the most distinctive character separating it from Ochre-bellied Hawk-owl is the white lower underparts streaked with brown.

Togian Hawk-owl has similar upperparts coloration to those of two MZB specimens of Speckled Hawk-owl from Lindu (central Sulawesi) and Rurukan (northern Sulawesi). Any difference would be difficult to discern in the field, for instance Mars Brown or Verona Brown versus Raw Umber, respectively. However, Togian Hawk-owl's underparts differ from those of Speckled Hawk-Owl (white with streaks of Mars Brown and Verona Brown versus Prout's Brown [121A] with dense and uniform short bars of Buff [124]). The tail feathers are, unlike Togian Hawk-owl, relatively short. The tarsus of Speckled Hawk-owl is heavily and densely feathered, unlike Togian Hawk-owl. Like Togian Hawk-owl, however, the toes are bristled.

The migratory Brown Hawk-owl *N. scutulata japonica* is larger (but much smaller than Barking Owl). Two MZB specimens, from Amurang (northern Sulawesi) and Buru (in the Moluccas), were examined. Upperparts between Warm Sepia (221A) and darker than Ground Cinnamon (239), for the Buru and Amurang specimens, respectively, and unlike Togian Hawk-Owl. Underparts (from breast to vent) uniformly and heavily streaked, unlike Togian Hawk-Owl. These streaks varied between Warm Sepia (Buru) and Ground Cinnamon (Amurang), and white washed Buff (124). Unlike Togian Hawk-owl, tail bars pale and relatively broad, with the pale bands slightly wider than the darker bands. Unlike Togian Hawk-owl, tarsus feathered, albeit less densely than Barking Owl. Like Togian Hawk owl, toes bristled.

Barking Owl is markedly larger (e.g. wing of three MZB specimens from Obi, in the central Moluccas, averaged 260 mm) and the upperparts markedly paler, almost Verona Brown (223B). Underparts pale with elongated streaks, alternating between Sayal Brown (223C) and Yellow Ochre (123C), from the upper breast, not restricted to the lower breast as in Togian Hawk-owl. Tail bars less pronounced and

TABLE 2

Comparisons of colour (Smithe 1975) of *Ninox burhani*, *N. ochracea*, *N. punctulata*, *N. scutulata* and *N. connivens*.

Plumage	*Ninox burhani*	*Ninox ochracea*	*Ninox punctulata*	*Ninox scutulata*	*Ninox connivens*
Front of head, crown and mantle feathers	Between Mars Brown (223A) and Verona Brown (223B), crown feathers with fine bars of Sayal Brown (223C)	Between Mars Brown (223A) and Verona Brown (223B)	Raw Umber (223)	Between Warm Sepia (221A) and darker than Ground Cinnamon (239), on Buru and Amurang specimens respectively	Approaching Verona Brown (223B)
Supercilium	Present	Present	Present	Present	Present
Upperparts	Between Mars Brown (223A) and Verona Brown (223B)	Between Mars Brown (223A) and Verona Brown (223B)	Raw Umber (223)	Between Warm Sepia (221A) and darker than Ground Cinnamon (239), Buru and Amurang specimens respectively	Verona Brown (223B)
Scapulars and primaries	Between Raw Umber (223) and Mars Brown (223A), with patches of whitish and Tawny Olive (223D)	Mars Brown (223A) with patches of white and Tawny Olive (223D)	Raw Umber (223)	As above	Verona Brown (223B)
Flight feathers	Patterned, mostly with triangular spots	Patterned, mostly with triangular spots	Patterned with spots, but much smaller than those in other species	Patterned with bars and a few white spots on the inner webs of the primaries	Patterned with bars and a few white spots on the inner webs of the primaries
Breast feathers	Between Mars Brown (223A) and Verona Brown (223B)	Clay (123B) with dark Brussel's Brown (121B)	Raw Umber (223). Upper breast has a broad dark band (Raw Umber, 223) between chin and lower breast, which are white or Buff (124)	Uniformly and heavily (boldly) streaked. These streaks vary between Warm Sepia (221A, Buru) and Ground Cinnamon (239, Amurang)	Buff (124) with elongated streaks of Sayal Brown (223C) to Yellow Ochre (123C)

Plumage	*Ninox burhani*	*Ninox ochracea*	*Ninox punctulata*	*Ninox scutulata*	*Ninox connivens*
Abdomen	White with streaks of Mars Brown (223A) and Verona Brown (223B), and Raw Umber (223) shafts	Between Clay (123B) and Yellow Ochre (123C)	Prout's Brown (121A) with dense and uniform small bars of Buff (124)	As above	As above
Tail bands and coloration	Tail bands very pronounced, and dark bands much broader than pale bands. Dorsal: the dark bands approach between Dark Greyish Brown (20) and Fuscous (21), with paler bands of Tawny Olive (223D)	Tail bands less pronounced, and dark bands broader than pale bands. Dorsal: dark bands of Prout's Brown (121A) and paler bands between Sayal Brown (223C) and Tawny Olive (223D). Bands on outer part of the inner webs had a Chamois half-band (123D)	Tail bands highly pronounced, with very narrow pale bars. Dorsal: the dark bands approach Raw Umber (223) and pale bands approach Buff (124)	Tail bands very pronounced, with broader pale bands. Dorsal: pale bands are the same or paler than the upperparts (Amurang and Buru specimens, respectively), whereas the dark bands are Vandyke Brown (121)	Tail bands less pronounced, with indistinctly contrasting pale bands. Dorsal: darker bands of Mars Brown (223A), and paler bands of Verona Brown
Tarsus	Unfeathered, but bristled	Unfeathered, but bristled	Heavily and densely feathered	Feathered	Heavily and densely feathered
Toes	Bristled	Bristled	Bristled	Bristled	Bristled

relatively broad. Unlike Togian Hawk-owl, tarsus feathered, but like Togian Hawk-owl, its toes are bristled.

Habitat. The new species has been observed in disturbed lowland and hill forest, mixed gardens and sago swamp, at elevations from sea level to 400 m. Although it is found regularly in scrubby forests, such locations are within a mosaic of evergreen rainforest remnants in various states of disturbance. The owl appears rare within garden and settlements, for instance at the villages of Wakai and Malenge, and thus is generally a forest species. Roosts in disturbed lowland forest are usually heavily shaded and at the mid-canopy level, being further characterised by dense stands of narrow-girthed trees entangled with vines, and frequently heavy bamboo cover, a microhabitat also used by other typical owls in the islands (see below).

Etymology. The species is named for Burhan of Benteng village, in recognition of his knowledge of the birdlife of Togian. Burhan, Iling Taskir, Nasution and other members of the local community are capable students of, and interested to conserve, the islands' birds and their habitats.

Notes. The type specimen was caught alive in scrubby forest on 8 April 2001 (*c*.13.00 h), by R. M. Hidayat. Initially, blowpipes with paper-wrapped sticks were employed, but these failed even to stun the bird. The specimen was eventually caught alive using a catapult and small stone. On 14 April 2001, it was taken to Ragunan Zoo, Jakarta, for veterinary care but died 48 hours later. The holotype was prepared as a study skin by Anandang on 16 April 2001, and subsequently reshaped with the assistance of Mohammad Toha, one of the best taxidermists at MZB, one week before his untimely death on 10 July 2002.

The paratype was taken once field observations had proved that the species was sufficiently common to warrant further specimen collection, and that the available habitat sufficiently extensive to suggest that the taxon is present throughout much of the archipelago (cf. Collar 2000). To minimise impact to the local population, the second specimen was taken at a different locality almost one year later. It was collected at a sago swamp near Baulu village, Togian Island, at sea level, on 26 March 2002 (*c*.09.00 h). Prior to its capture, the bird was roosting on a branch 2.5 m above ground, near its presumed mate. It was collected using an air rifle, as current local transportation logistics now prohibit the live transport of birds to MZB.

Observations

25 December 1999, c.20.15–20.30 h, Benteng village

Three unidentified hawk-owls, hunting from perches in a garden, were observed at night using torches. They were medium-sized true owls, lacking ear-tufts, with a dark mantle scalloped paler, darkish facial disk, grey bill, white underwings and undertail patterned with fine black spots, pale underparts broadly streaked pale brown on the upper breast, becoming less dense on the abdomen. Due to the poor light it was unclear whether the mantle was dark brown, as in Brown Hawk-owl, which is known from the Sulawesi subregion. Indeed, the first individual was initially identified as a Brown Hawk-owl, but this species was eliminated at the time of observation, and subsequently, because of the patterned upperparts and paler-streaked underparts.

27 December 1999, c.09.00–09.10 h, Benteng

A single unidentified hawk-owl was flushed from a roost in bamboo. It was medium-sized and brownish, with yellow irides, pale supercilia, a uniformly deep chestnut-brown head, greyish-brown mantle with bold pale spots, boldly streaked greyish-brown, pale underparts and brownish feet. This individual apparently differed from those observed two nights previously in having a paler mantle and less white on the breast.

24 February 2001, c.08.30–08.45 h, Benteng

Three unidentified hawk-owls roosting in the mid-canopy on a forested hillside were flushed and good views obtained of two. Upperparts, head, chin, throat and upper breast (to approximately the wing bend) brown. Supercilia whitish. Lower breast and abdomen white, with long brown shaft-streaks that decreased on the belly, and vent entirely white. Wings patterned with rounded spots, becoming denser near the trailing edge. Irides yellow and bill grey to black.

14 May 2001, c.15.00 h, Benteng

The fourth observation was at 400 m on the slopes above Benteng, where a pair of unidentified hawk-owls was flushed. Their plumage did not appear to differ from that of the type specimen collected the previous month.

27 July 2001, c.1315–13.20 h, Belas (Benteng)

Two unidentified hawk-owls were flushed from their roost, in vine-entangled 5-m tall hillside scrubby forest. After ten minutes they were relocated and good views obtained for *c*.5 minutes, whereupon they disappeared again. They were similar in appearance, but differed in size. Head and face uniform dark brown, with an indistinct facial disk and obvious whitish supercilium. Irides yellow, mantle brown, spotted ochraceous-buff on the wing-coverts and scapulars. Underparts, from breast to vent, uniform ochre with traces of a few weak, irregular streaks on the upper breast. Their ochre bellies clearly identified them as Ochre-bellied Hawk-owls, although the white chin was not seen (cf. Coates & Bishop 1997). Bill blackish with a paler greenish culmen. Tail relatively short, but tail bars (if any) not seen. Feet yellowish green. They appeared to differ in size by *c*.20–30%. Based on this and their behaviour (i.e. two birds roosting and remaining together), it is probable that they were a pair.

28 July 2001, c.13.00–13.10 h, Benteng

The next observation was at the edge of primary forest, on a slope at *c*.100 m. Initially a guttural call was heard (at 13.00 h.), *KO-KORO-OK*, preceded by a single-note croak, which is the most frequently heard call (see below). After five minutes two hawk-owls were found roosting together 10 m above ground. They flew but one was briefly relocated. It appeared similar to the type specimen, with dark brown mantle and wings, scapular spots, a brown head with an indistinct facial disk, whitish supercilia and yellow irides. Breast whitish, boldly streaked darkish chestnut-brown and vent uniformly pale (the diagnostic characters that identify the type specimen). Bill dark grey with a greenish culmen. Tail relatively short, i.e. little longer than the wing.

1 August 2001, c.11.25–11.30 h, Belas (Benteng)

The final observation was made at Belas (where *N. ochracea* was also found). Two flushed from a roost departed in different directions. After searching for 30 minutes, only one could be relocated and was observed for seven minutes, before it disappeared into denser vegetation. It was a dark brown hawk-owl with a brown head and mantle, an indistinct dark brown facial disk, spotted scapulars and wing-coverts, yellow irides, whitish supercilia, a dark greenish bill and relatively short tail. The underparts pattern, however, differed from the type specimen, in being pale ochraceous, but somewhat paler than in *N. ochracea*. Like the type specimen, the breast and abdomen were streaked brownish and the vent unmarked. Thus, this individual appeared intermediate in plumage, but closer to *N. burhani*. The tail was not seen well, but its underside was barred relatively densely with ochre and brown.

Vocalisations

No direct observation was made of birds vocalising. However, one call, which was heard extensively on Togian and Batudaka islands, was presumed to belong to this form for two reasons. Firstly, both the call and the owl are relatively common. Secondly, on 28 July 2001, the characteristic call was heard immediately prior to a sighting of two *N. burhani*.

This call is a gruff, low-pitched, two- to four-syllable croak, *KOK-KO-RO-OK*! The sequence is occasionally repeated and sometimes preceded by an introductory croaking note. It differs from that of the migratory form of Brown Hawk-owl *N. scutulata japonica*, which utters a mellow whistle, sometimes in couplets (Coates & Bishop 1997, King 2002). Birds possibly singing in territorial defence were noted frequently. Calling was noted at 20.00–04.00 h (December 1999 and February 2001).

Distribution and status

Observations and vocalisations indicate that the new owl is resident and probably breeds locally in Malenge, Togian and Batudaka islands (based on interviews with Amir Dodoa, Alan and Salim). That the owl is resident during the northern winter is confirmed by observations in July–August 2001. Croaking notes that we believe pertain to the new species were detected further east, on Waleabahi Island (in March 2002), implying that it is widespread in moderate numbers through the archipelago.

Surprisingly, during the most recent visit to the islands (18–31 July 2003), a six-day search of the species' day-roosting locations (on 19–24 July) failed to produce any sightings, although vocalisations were heard on several nights. The period in which this visit occurred coincided with the end of the rainy season. The difficulty in finding the species during daytime might have been due to increased concealment and it is postulated that at this season most birds are perhaps moulting and thus more secretive.

Discussion

The discovery of a new endemic bird in the Togian Islands is unexpected, given that the group is scarcely isolated from the eastern peninsula of Sulawesi. Although the water separating the islands from the mainland reaches *c.*1,440 m in places, a bathymetric map suggests that a long narrow bridge in shallow water, less than 150 m deep, appears to connect the shelves of the eastern peninsula to the Togian Islands. Between them are numerous stepping-stone islands. This potential land bridge is broken only by a narrow fault, less than 3 km wide and 500 m deep (BAKOSURTANAL 1993).

The co-occurrence of two species of Ninox (*N. burhani* and *N. ochracea*) merits interpretation. It is probable that the insular processes within the Togian Islands provides for the formation of neo-endemics, of which *Ninox burhani* is part. It is therefore postulated that birds of this group are subject to inter-archipelago speciation, leading to these owls occurring in sympatry (as opposed to closely related allospecies), therefore indicating complete speciation (cf. Diamond 1977).

Conclusion

The discovery of a new species of owl offers hope that the Togian group might produce further endemic vertebrates. Furthermore, Togian Hawk-owl, although persisting in dense scrub, is principally a forest-dependent species. The discovery provides additional justification to halt forest clearance, which is increasing in the Togian Islands (e.g. Indrawan 2000).

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Nomenclatural solution for a polyphyletic *Agelaius*

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One function of taxonomy is to reflect phylogeny and evolutionary relatedness. Indeed, for many researchers, taxonomy represents a simple tool for introducing assumptions of phylogenetic relationships into comparative studies of extant taxa. The difficulty is that our understanding of avian phylogeny is improving very rapidly and taxonomy, which changes very slowly, is increasingly in conflict with this new information. If taxonomy is to be a useful tool for biologists, we must balance our desire for stability in nomenclature with the need for taxonomy to reflect accurately our knowledge of evolutionary relationships. Consequently, evolutionary relationships and overlying taxonomy need to be re-affirmed on a regular basis. In the light of significant advances in our understanding of the evolutionary relationships of the species classified in the genus *Agelaius*, we believe it is time to propose formal changes to blackbird taxonomy.

The New World blackbird genus *Agelaius* presently consists of a group of ten morphologically and ecologically similar species (Hellmayr 1937, Blake 1968, Sibley & Monroe 1990). Males have black plumage with some species having yellow or chestnut on the head and others with yellow or red epaulets; females of this group have either a duller version of the male plumage or are brown and streaked. Most species are marsh-nesters. However, the group has been shown to be polyphyletic based on cladistic analyses of 879 base-pairs of cytochrome-*b* and 1035 bases of ND2 mtDNA sequence data. Species traditionally placed in the genus *Agelaius* actually form three separate clades (Lanyon 1994, Lanyon & Omland 1999, Johnson & Lanyon 1999; see also Freeman & Zink 1995). Taxonomic recommendations to describe this new understanding of the relationships of these taxa have not yet been made. We suggest a solution here.

Among the ten species *Agelaius*, three monophyletic groups have been defined by genetic analyses and are identified as follows:

Group 1 (five species in two clusters—[a] ***humeralis*** of Cuba and Haiti, and ***xanthomus*** of Puerto Rico; and [b] ***phoeniceus*** of North America, ***tricolor*** of California, USA, and ***assimilis*** of western Cuba). In genetic analyses, Group 1 species form a sister-taxon to the brood parasitic cowbirds (*Molothrus* [encompassing *Scaphidura*]).

Group 2 (two species—***icterocephalus*** of northern South America and ***ruficapillus*** of Brazil to northern Argentina). In genetic analyses, Group 2 species form a cluster with sister-taxa *Xanthopsar* and *Pseudoleistes* and then joining with *Agelaioides*.

Group 3 (three species—***cyanopus*** of southern Brazil to northern Argentina, ***xanthophthalmus*** of Peru and Ecuador, and ***thilius*** of temperate South America; *thilius* appears slightly more distant from the other two species). In genetic analyses, Group 3 species form a sister-group to the cluster described above (i.e., the taxa *Agelaioides*, Group 2, *Xanthopsar* and *Pseudoleistes*).

The marsh blackbirds of Group 1 are distinctly separated from other '*Agelaius*' in genetic analyses, in geography, and somewhat in skeletal morphology (Webster 2003). These five species have distributions in North America and the Caribbean; all species in both Groups 2 and 3 are limited to South America. Group 1 species show clumped breeding behaviours, either in true colonies or as packed clusters of normal territories. In addition, these species are often polygynous, and all five nest in marshes, which is different from the breeding habitats occupied by most members of their sister group (i.e., *Quiscalus* and *Euphagus*; see Searcy *et al.* 1999, Johnson & Lanyon 2000). We view it as appropriate to unite the species of Group

1 in a single genus. As *phoeniceus* is the type species of the genus *Agelaius* Vieillot, these five species are retained as members of *Agelaius*.

The question of how best to allow taxonomy to reflect phylogeny in the case of Groups 2 and 3 is more complicated. To some extent the number of genera to recognise is subjective and a matter of taste. Recognition of anything from a single genus (including all members of Groups 2 and 3 as well as all species of *Pseudoleistes*, *Xanthopsar*, *Agelaioides*, *Amblyramphus*, *Curaeus* and *Gnorimopsar*) to as many as nine genera (separate genera for all of the six other genera currently recognized in this clade, as listed above, and one genus for Group 2 and 2 genera for species of Group 3) is consistent with the known phylogeny of these species. Recognition of a single genus, however, would obscure a great deal of ecological diversity.

Some differences exist between members of Groups 2 and 3 with respect to feeding ecology and aspects of their breeding biology. Arthropods (mostly insects) seem to comprise 50% or more of the diet of the 'thin-billed' (Group 3) species. Detailed studies are available for *thilius* in Argentina (Darrieu *et al.* 2001). Stomach contents of 85 adults from northern Buenos Aires province (all seasons combined) comprised 78% animal food and 22% seeds. Among insects ingested (66% of all food items), weevils (Curculionidae: Coleoptera), aquatic midges (Stratiomydae: Diptera) and caterpillars (Lepidoptera) were numerically important. Ingested seeds were mostly of native grasses, particularly *Panicum* sp. According to Orians (1980), *thilius* also feeds on emerging aquatic insects, including dragonflies and damselflies (Odonata). Less extensive data on stomach contents also are available for *cyanopus* (Beltzer & Paporello 1983). This blackbird is more aquatic than *thilius*, and commonly picks prey from the underside of floating plants (*Pistia*, *Azolla*, etc.) or from the water surface. Stomach contents contained *c.*50% of insect prey, including beetles (Curculionidae, Dysticidae: Coleoptera) and flies (Chironomidae, Stratiomyiidae: Diptera). This species also feeds on small cichlid fishes up to 3 cm long. Data on *xanthophtalmus* food are scant, but habitat choice in this icterid (floating meadows of *Panicum* grass, Orians & Orians 2000) suggests aquatic adaptations similar to those of *cyanopus*.

The two species in Group 2 contrast with the 'thin-billed' group. Both *icterocephalus* and *ruficapillus* consume large amounts of seeds even in the breeding season and both species, particularly *ruficapillus*, are regarded as important pests of cultivated rice (e.g. ffrench 1991, Bello Falavena 1988, Bruggers & Zaccagnini 1994). Stomach contents of *ruficapillus* may contain up to 62% of rice seeds (Vieira *et al.* 2000). In addition, males of these species have similar pattern of 'display colours' in their plumage—the head is yellow (*icterocephalus*) or chestnut (*ruficapillus*)—while 'display colours' in all other '*Agelaius*' is either lacking or limited to epaulets (wing-coverts) only.

Differences in mating system and parental behaviour also occur. In Group 2, *icterocephalus* is usually polygynous (Wiley & Wiley 1980). The mating system of *ruficapillus* was described as monogamous (Bello Falavena 1988) but more recent data indicate that polygyny is common (Lyon 1997, C. Feare pers. comm.). In *icterocephalus*, nests are started and built mostly by males (Wiley & Wiley 1980, Naranjo 1995), who attract females to the structure by singing and displaying. Females that accept a nest add a nest lining of fine grass. Comparable data for *ruficapillus* seem more controversial. Klimaitis (1973) mentioned nest building only by females in one Argentinian *ruficapillus* population, but all other studies for the species contradict his statement. Nest building mostly by males has been found elsewhere in Argentina (Lyon 1997, unpublished data of R. Fraga for five nests in Buenos Aires, Entre Ríos and Chaco provinces, unpublished data of C. Feare in Santa Fe Province), and is the standard behaviour in Brazilian populations as well (Belton 1985, Bello Falavena 1988, Cirne *et al.* 2000). Therefore, the account by Klimaitis (1973) probably is erroneous; his paper mentions that he did not visit his colony during a critical 15-day period that included most of the nest-building phase. According to Lyon (1997), males of *ruficapillus* build nests during the courtship phase while singing and displaying; nests not occupied by females quickly become disheveled and deteriorate. This suggests that females finish or complete the nest structure.

In some bird families (e.g., Ploceidae [Collias & Collias 1964]) males commonly attract females by building a nest, but this courtship pattern in *icterocephalus* and *ruficapillus* seems unique for icterids (Orians 1985) and represents good evidence of a close phylogenetic relationship between both species of Group 2. Within the 'thin-billed' Group 3, monogamy seems to be the rule (Borshchein *et al.* 1994 for *cyanopus*; Orians 1980 for *thilius*, and Orians & Orians 2000 for *xanthophtalmus*). According to theses sources the nest is built by the female in *thilius* and *cyanopus*; data for *xanthophtalmus* are lacking.

We believe that this ecological diversity warrants recognition at the generic level and, therefore, reject the idea of creating a single large genus for Group 2, Group 3, and their close relatives. Instead we prefer a more conservative change in taxonomy that recognises these three groups at the generic level. We note also that *Xanthopsar flavus*—sister-taxon of Group 2—has been lumped sometimes into '*Agelaius*' (see Sclater 1886, Short 1975, Ridgely & Tudor 1989, Sibley & Monroe 1990), but this species' behaviour and ecology (Jaramillo & Burke 1999) and its genetics (Lanyon 1994, Lanyon & Omland 1999) indicate *Xanthopsar* to be closer to *Pseudoleistes* rather than to Group 2 species. We do not consider *Xanthopsar flavus* to be '*Agelaius*'.

We considered the placement of *thilius* in its own genus to reflect certain ecological, vocal, and plumage differences from the other Group 3 species, as detailed above. If this were done, however, then *Agelasticus* would be limited to *thilius* and a new name would be needed for the two remaining Group 3 species.

Our preference is for a taxonomy that is consistent with phylogeny, that introduces the fewest necessary taxonomic changes to reflect phylogeny, and that recognises the natural history differences between Groups 2 and 3. Therefore, we propose resurrection of *Chrysomus* Swainson for Group 2 and *Agelasticus* Cabanis for Group 3. Our proposed nomenclatural solution for *Agelaius*, as indicated below, identifies 3 genera:

Group 1: AGELAIUS Vieillot 1816 (type *Oriolus phoeniceus* Linnaeus 1766)
***Agelaius humeralis* (Vigors 1827)**
Leistes humeralis Vigors 1827, Zool. J. 3: 442 [Tawny-shouldered Blackbird]
***Agelaius xanthomus* (Sclater 1862)**
Icterus xanthomus P. L. Sclater 1862, Catalogue Coll. Amer. Birds, p. 131 [Yellow-shouldered Blackbird]
***Agelaius phoeniceus* (Linnaeus 1766)**
Oriolus phoeniceus Linnaeus 1766, Syst. Nat., 12 ed., p. 161 [Red-winged Blackbird]
***Agelaius tricolor* (Audubon 1837)**
Icterus tricolor Audubon 1837, Birds Amer. vol. 4, pl. 388, fig. 1 [Tricolored Blackbird]
***Agelaius assimilis* Lembeye 1850**
Agelaius assimilis Lembeye 1850, Aves Isla Cuba, p. 64, pl. 9, fig. 3 [Red-shouldered Blackbird]

Group 2: CHRYSOMUS Swainson 1837 (type *Oriolus icterocephalus* Linnaeus 1766)
***Chrysomus icterocephalus* (Linnaeus 1766)**
Oriolus icterocephalus Linnaeus 1766, Syst. Nat. 12 ed., p. 163 [Yellow-hooded Blackbird]
***Chrysomus ruficapillus* (Vieillot 1819)**
Agelaius ruficapillus Vieillot 1819, Nouv. Dict. Hist. Nat. 34: 556 [= 536], [Chestnut-capped Blackbird]

Group 3: AGELASTICUS Cabanis 1851 (type *Turdus thilius* Molina 1782)
***Agelasticus cyanopus* (Vieillot 1819)**
Agelaius cyanopus Vieillot 1819, Nouv. Dict. Hist. Nat. 34: 552 [Unicoloured Blackbird]
***Agelasticus xanthophthalmus* (Short 1969)**
Agelaius xanthophthalmus Short 1969, Occ. Pap. Mus. Zool. Louisiana State Univ. no. 37 [Pale-eyed Blackbird]
***Agelasticus thilius* (Molina 1782)**
Turdus thilius Molina 1782, Saggio Storia Nat. Chile, p. 250, 345 [Yellow-winged Blackbird]

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Range extension for Grey-headed Tanager *Eucometis penicillata* in south-east Brazil

by Marcos Rodrigues & Henrique Belfort Gomes

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Large areas in South America have still never been visited by ornithologists (Silva 1995a). This is particularly true for the Cerrado region of central Brazil, which encompasses 1.8 million km^2 (Silva 1995b), and the semi-arid region of Caatinga in north-east Brazil, extending to 0.9 million km^2 (Sampaio 1995, Pacheco 2000). This paper describes the geographic distribution of a forest bird of South America, Grey-headed Tanager *Eucometis penicillata*. Although common, the species has been systematically overlooked in south-east Brazil by all bird compilations published so far.

Grey-headed Tanager is an Oscine passerine member of the Thraupini tribe of the Emberizinae subfamily Fringillidae (Sibley & Monroe 1990). This tribe encompasses 413 species distributed mainly in the Neotropical region (Sibley & Monroe 1990). *Eucometis* is a monotypic genus occurring from southern Mexico to south-eastern Brazil and varies in size and plumage over its range, where seven subspecies are recognised (Nordgaard-Olesen 1974, Isler & Isler 1987). *Eucometis penicillata albicollis* is the race that occurs mostly in the Cerrado region of central Brazil, north-eastern Paraguay and eastern Bolivia (Nordgaard-Olesen 1974, Isler & Isler 1987). Here, we follow the Ab'Saber (1977) definition for the Cerrado. The region includes most areas of the states of Mato Grosso, Mato Grosso do Sul and Tocantins; western Minas Gerais and Bahia; southern Maranhão and Piauí; all of the state of Goiás and the Distrito Federal; north-eastern Paraguay and eastern Bolivia (see Silva 1995a for a detailed description of the area).

Eucometis penicillata albicollis inhabits forest undergrowth and thickets, always near river edges (Isler & Isler 1987, Sick 1997). According to Silva (1995a), Grey-headed Tanager is a forest-dependent species, and in the Cerrado region it is associated with gallery forests. According to Ridgely & Tudor (1989), the species' abundance ranges from uncommon to locally fairly common.

The first report of Grey-headed Tanager in the Brazilian Cerrado region came from Pelzeln (1870) who organised the diary and skins of Johannes Natterer, a pioneer collector of the Brazilian fauna. Although Natterer had also travelled in the west of Minas Gerais, the seven specimens of Grey-headed Tanager were collected only in the states of Goiás and Mato Grosso (Pelzeln 1870). Pinto (1952) reviewed the bird collections made in the state of Minas Gerais and Grey-headed Tanager was not included in his annotated list. Schaueensee (1970), in his classic *A guide to the birds of South America*, documented the occurrence of Grey-headed Tanager in Brazil in the states of Mato Grosso, Goiás and São Paulo. Later, in a monograph of the Thraupini, Norgaard-Olesen (1974) set the distribution of *E. penicillata albicollis* as being from east Bolivia to south-central Brazil (from Mato Grosso and Goiás southwards to north-west São Paulo). In the first edition of Helmut Sick's *Ornitologia brasileira* (1985), Grey-headed Tanager was stated to occur in Goiás, western São Paulo, and east of Pará and Maranhão. Once again, the species appeared to not occur in Minas Gerais. The same distribution was assigned by Isler & Isler (1987), although their map for *E. penicillata albicollis* did include the extreme west of Minas Gerais, in the gallery forests of the rio Paranaíba, a major tributary of the Paraná basin, and inland towards the east, in a region known as 'Triângulo Mineiro' (Fig. 1). This distribution was essentially followed by Ridgely & Tudor (1989) and Sibley & Monroe (1990), although the latter authors did not include Minas Gerais in the species' distribution. In 1997, a second edition of Sick's *Ornitologia brasileira* was reviewed and enlarged by J. F. Pacheco, who included Grey-headed Tanager for Minas Gerais, although the source for such information was not given.

Subsequent reference books have shown that in Minas Gerais Grey-headed Tanager is confined to the extreme west of the state, in the 'Triangulo Mineiro' region, possibly extending to the headwaters of the rio Paranaíba and its tributaries, more or less at the longitude of São Gotardo (approximately 46°00' W) (see Fig. 1).

In fact, a recent paper on the effects of forest fragmentation on birds of the Cerrado, conducted in the 'Triangulo Mineiro' region, found Grey-headed Tanager to be a common resident of fragments as small as 7.5 ha (Marini 2001).

We have been working since 1999 on the ecology of landbirds at the Parque Nacional da Serra do Cipó (hereafter Parque), municipality of Jaboticatubas, some 300 km east of the headwaters of the rio Paranaíba (Rodrigues *et al.* 2000a, 2000b, Rodrigues & Carrara in press). On two separate occasions we were able to observe and capture Grey-headed Tanager. The Serra do Cipó is the name of a portion of the Espinhaço Range, a mountain chain with peaks reaching 1,700 m that cross from south to north through most of Minas Gerais, separating two important biomes in its central and southern portion: the Cerrado on the western slope and the Atlantic Forest on the eastern slope (Ab'Saber 1977, Giulietti *et al.* 1997).

Our first sighting of Grey-headed Tanager at the Parque was made on 29 August 1999, in the closed undergrowth of tall gallery forest of the rio Mascates, a tributary of the rio Cipó, at *c.*800 m altitude, at the base of the Farofa waterfall (19°22'S, 43°35'W). On the second occasion, on 13 October 2001, we captured a Grey-headed Tanager in a mist-net within dense thickets 10 m from the banks of the rio Cipó (19°20'S, 43°36'W), near the Parque headquarters (*c.*800 m altitude). The areas differ from each other in the sense that the Farofa waterfall forest is much better preserved than the young thicket stage, although the river they follow is the same.

This sight record and capture of the Grey-headed Tanager extends its known range some 400 km eastwards. In addition, our records show that it occurs at the edge of the Cerrado region, and on the east bank of the rio São Francisco basin.

However, these are not the first records of Grey-headed Tanager in the Serra do Cipó west-slope region. Willis & Oniki (1991) had recorded the bird during surveys of eight sites in Minas Gerais in 1977 and 1978. Grey-headed Tanager was recorded on the west bank of the rio Cipó, in a patch of deciduous woodland near to the road 88 km from Belo Horizonte. This record was published in a paper on cloacal temperatures of some birds of Minas Gerais by Oniki (1980) and a paper on its behaviour by Willis (1985).

We have searched for other possible records of Grey-headed Tanager in Minas Gerais using available faunal lists in the literature and in the collection of the Universidade Federal de Minas Gerais. The results are shown in Table 1 and plotted in Fig. 1.

Discussion

Specimens of Grey-headed Tanager have been collected in Minas Gerais since the late 1960s. Although the entire state has suffered great human impact since Brazilian colonial times, major changes such as deforestation, leading to severe fragmentation, occurred in its Atlantic portion, east of the Espinhaço Range (Dean 1996). The Cerrado region of Minas Gerais started to be heavily modified in the

TABLE 1

Records of Grey-headed Tanager *Eucometis penicillata* in the state of Minas Gerais, south-eastern Brazil. The source labelled DZ refers to the ornithological collection of the Universidade Federal de Minas Gerais.

Locality	**Municipality**	**Date**	**Source**
Rio São Miguel, Vale do Urucuia	Arinos	21 September 1969	DZ 2114
Cardeal Mota (19°21 S, 43°37'W)	Santana do Riacho	1977–1978	Oniki 1980, Willis & Oniki 1991
Fazenda Jaguara (19°29'S, 44°00'W)	Lagoa Santa	1987	Christiansen & Pitter 1997
Mata da Barrigud	Pedrinópolis	30 August 1987	DZ 2113
UHE-Bocaína	Coromandel	2 May 1988	DZ 2111
Fazenda da Mata (18°30'S, 48°03'W)	Araguari	1994–1996	Marini 2001
Cruzeiro dos Peixotos (18°46'S, 48°21'W)	Uberlândia	1994–1996	Marini 2001
Fazenda Exp. do Glória (18°52'S, 48°13'W)	Uberlândia	1994–1996	Marini 200
Reserva Biológica do Panga (19°11'S, 48°21'W)	Uberlândia	1994–1996	Marini 2001
Granja Marileuza (18°52'S, 48°15'W)	Uberlândia	1994–1996	Marini 2001
Farofa waterfall (19°22'S, 43°35'W)	Jaboticatubas	2000	this work
Parque headquarters (19°20'S, 43°37'W)	Jaboticatubas	2002	this work
Fazenda Brejão, west bank of the rio Paracatu	Brasilândia de Minas	2002	M. Rodrigues unpubl. data
Fazenda Santa Cruz (17°00'S, 46°00'W)	Felixlândia	2002	DZ 3478

early 1960s, following the building of Brasília, the capital of Brazil, in the Brazilian Central Highlands. So, it is reasonable to think that Grey-headed Tanager had been present, at least on the west bank of the rio São Francisco basin, much earlier than this. Grey-headed Tanager is associated with gallery forests, which form a dense network within the Cerrado region. This network of forests makes contact with all hydrological basins in the Cerrado region of Minas Gerais, namely the São Francisco and the Paraná basin (rio Paranaíba and rio Grande), and which in turn are connected to the Araguaia basin of Goiás state. With this background, one could have predicted the occurrence of Grey-headed Tanager east of the rio São Francisco and towards the rio Grande in the south. The rio São Francisco does not seem to have been a geographical barrier to the range of Grey-headed Tanager. So why has Grey-headed Tanager been overlooked here for so long? We put forward three, not exclusive, possible explanations.

The first, as illustrated by Silva (1995b), is that most of the Cerrado region area has never been visited by ornithologists. Very few published and complete bird surveys have been undertaken in the Cerrado of Minas Gerais (see historical account in Pinto 1952, and also Willis & Oniki 1991, Melo-Junior *et al.* 2001). As this area covers more than 200,000 km^2, the need for surveys must be emphasised.

The second is that Grey-headed Tanager has been extending its range in the past 40 years due to global and regional climatic changes, a phenomenon already observed in other bird species (Willis & Oniki 1985). According to Silva (1996), those bird species that depend on gallery forest have expanded and/or are expanding their ranges into the Cerrado region from their centres of distribution. He showed that Amazonian elements occurring in the Cerrado are restricted to its

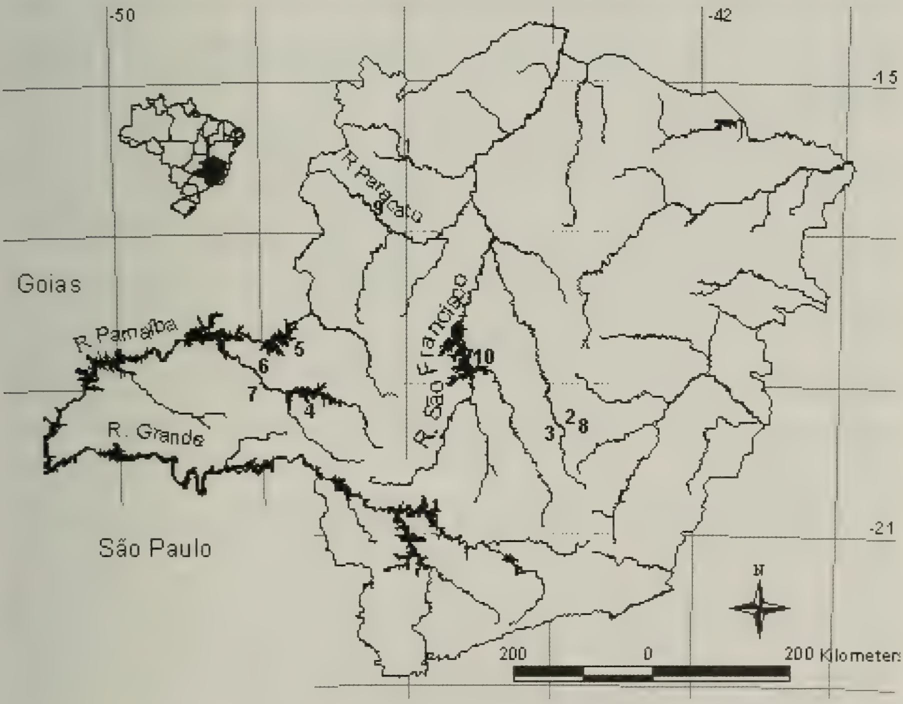

Figure 1. Major river basins of the Cerrado region of Minas Gerais and recent records for Grey-headed Tanager *Eucometis penicillata* in chronological order. 1, Arinos; 2, Santana do Riacho; 3, Lagoa Santa; 4, Pedrinópolis; 5, Coromandel; 6, Araguari; 7, Uberlândia; 8, Jaboticatubas; 9, Brasilândia de Minas; 10, Felixlândia.

peripheral depression and low-altitude plateaux. This is not the case for Grey-headed Tanager, a bird species not considered in Silva's (1996) analysis. Grey-headed Tanager is an Amazonian element within the Cerrado region, but not restricted to peripheral depressions near the border of the two biomes. In fact, according to the data presented here, Grey-headed Tanager occurs at the border of Cerrado–Atlantic forest domain on the top of the plateau, as demonstrated by the Serra do Cipó individuals. Perhaps Silva (1996) could not include Grey-headed Tanager in his dataset because all of the localities presented in the current paper were not accessible at that time. Therefore, with the data available nowadays, it is difficult to determine if Grey-headed Tanager is expanding its range. However, a few 19th-century naturalists made comprehensive bird collections within the Cerrado of Minas Gerais, but Grey-headed Tanager did not appear in any of those collections (Pinto 1952). A good example is the large bird collection made by the Danish naturalists Peter Lund and J. Reinhardt between 1835 and 1855 in Lagoa Santa, a locality on the border of the Cerrado and Atlantic domains (Reinhardt 1870 *in* Pinto 1952, Warming 1908). Lund and Reinhardt did not collect or observe Grey-headed Tanager. More than 100 years later, Grey-headed Tanager was observed by Christiansen & Pitter (1997) at the very same locality surveyed by Lund and Reinhardt.

The third is that ornithological surveys have been insufficiently comprehensive to detect such an inconspicuous, although common, species. Most surveys do not show the 'species accumulation curve', a simple graphic tool that gives researchers a clue as to whether they have detected most species of a particular region. Moreover, most surveys have not used mist-nets or tape-recorders.

Therefore, if a common and possibly widespread bird has been overlooked for years, what about rare, inconspicuous, or even endemic species? As the number of professional ornithologists grows in Brazil, new localities for endemic species, and even new taxa, are being discovered (e.g. Vasconcelos *et al.* 2002). For instance, from 1983 to 1998, 17 new bird species were described from Brazil. Of those, 14 species were found in localities close to densely populated parts of south-eastern Brazil (Vasconcelos *et al.* 2002). We still need to assess the impact of these findings on our biodiversity pattern analysis.

Development of the understanding of the global distribution of biodiversity is one of the main objectives for ecologists and conservation biologists. Recent years have produced a large number of studies documenting broad-scale patterns of biodiversity (e.g. Bibby *et al.* 1992). Many of these studies have directly explored the implications of these patterns for conservation biology (e.g. Myers *et al.* 2000). However, we indicate here that more attention should be addressed to the completeness and accuracy of field data collection at the level of local study plots (Gaston 2000). The consequences of underestimation of diversity can go far beyond academic circles, since decision-makers are increasingly basing their policies on our scientific research.

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The correct name of the Afrotropical mainland subspecies of Barn Owl *Tyto alba*

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In a recent account of the barn owl family (Tytonidae) by one of us (Bruce 1999), MDB retained the Barn Owl *Tyto alba* population of Fernando Po (Bioko) as the endemic subspecies *poensis* (Fraser 1843), leaving all other Afrotropical birds (except *thomensis* (Hartlaub 1852) of São Tomé) as *affinis* (Blyth 1862). MDB also pointed out that if *poensis* is not recognised, then it replaces *affinis* because it is the oldest available name. However, several recent and influential works that have not accepted *poensis*, have nevertheless used the name *affinis* for mainland birds (Fry *et al.* 1988, König *et al.* 1999, Borrow & Demey 2001).

It is of interest to note that Blyth, the describer of *affinis*, subsequently wrote: '*S. affinis*, nobis (Ibis, 1862, p. 388), from South Africa, proves to be *S. poensis*, Fraser' (1866: 251). This interpretation was followed by Gray (1869). In Sharpe's revision of the species and family (1875) he merged a large number of the named taxa under *Strix flammea* (the old name for *T. alba*) due to the problem of understanding the range of variation, so that African birds were not separated from those of Europe, the Americas and other regions, and this treatment was followed for a time (e.g. Shelley 1896). Hartert (1913) provided the first comprehensive review of barn owls at a subspecific level, separating African birds as *T. a. maculata* (Brehm 1855), described from Sudan. He queried the identity of *poensis* although noting it may be the oldest name for African birds. The name *maculata* proved to be unavailable and Afrotropical birds were separated as *affinis* (Grant 1915).

Hartert continued to query *poensis* because he was still unable to examine any specimens from Fernando Po and retained *affinis* (1929). Bannerman (1933) was also unsure if Fraser's description, in the absence of a specimen, was unequivocally of *T. alba* and used *affinis* (thus also avoiding the vexing problem of dates). Peters (1940) used *affinis* and did not mention *poensis* at all. Mackworth-Praed & Grant (1957) did, however, believe that Fraser's description was of a barn owl and pointed out its priority over *affinis* if not kept separate, as did Basilio (1963), following Stresemann (in Wolff-Metternich & Stresemann 1956). Eck & Busse (1973) also queried *affinis* as a synonym of *poensis* but in a subsequent review of barn owls *affinis* was retained (Schneider 1977) and the anomaly was overlooked in a supplement (Eck 1995). Pérez del Val *et al.* (1994) merely listed *affinis* as the Fernando Po form, without mentioning *poensis*.

Is *poensis* separable morphologically from mainland birds? Chapin, the first author since Fraser to publish the results of a personal examination of material, thought that *poensis* might be a valid taxon. He believed that two specimens in the American Museum of Natural History [collected by Correia in 1929 (the first obtained from Fernando Po since the type specimen)] show 'more contrast in the vermiculation of crown, back, and wing-coverts than those of the mainland' (1939: 403–404). Mackworth-Praed & Grant (1957; see also 1970) accepted Chapin's observations as sufficient to recognise *poensis* as a subspecies endemic to Fernando Po. Basilio (1963), however, acknowledged *poensis* might not be valid although he retained *poensis* as separate from *affinis* following Stresemann (in Wolff-Metternich & Stresemann 1956), who noted *poensis* was similar to *affinis* but smaller (based on feather samples of a single female collected and measured by Wolff-Metternich in 1939). White accepted *poensis* as valid, his wording suggesting he was following Chapin (and Mackworth-Praed & Grant), although he added 'dorsal shaft streaks and ventral spots finer or smaller' (1965: 191), but it is not indicated if he had personally examined any specimens. The type specimen of *poensis* might be expected to be in the Natural History Museum, Tring, but it is not (Bannerman 1933) and apparently it has been missing for a long time (Hartlaub 1857, Sharpe 1876). However, there is a specimen labelled '*poensis*' and registered in 1842, but of uncertain provenance, possibly from the Cape Verde Islands (Sharpe 1875) or the Gulf of Guinea (Moore 2001).

Eisentraut (1973) had a single specimen from Fernando Po, and wrote [translation by N. Bahr]: 'Considering the high variability in tone and pattern, and with regard to the limited material available from Fernando Poo, it seems almost impossible to me to decide unambiguously if the race *poensis*..... is valid. Amadon (1953), who examined two further specimens collected on the island by Correia, left this question unanswered, too. The male I brought back agrees in colouration and markings with the description Bannerman [1933] gave for mainland *affinis* extensively. When comparing mainland material, especially from Cameroon, at the British Museum, two specimens almost exactly agreed with my island specimen in tone and markings. Therefore I am unable to accept an endemic race from Fernando Poo at the moment.'; de Naurois (1983) agreed.

We believe that Fraser's *Strix poensis,* based on a single specimen, does indeed refer to a *T. alba* obtained on Fernando Po during Fraser's stay from 15 May to 5 July 1842, although it is not clear if he himself collected the specimen (Fraser 1842, 1843, Moore 2001). No-one has provided any firm evidence of differences warranting the separation of *poensis* from mainland birds, and indeed the findings of Eisentraut (1973) certainly suggest there may be none. Consequently, the name *poensis* must be used for the mainland birds as well as those of Fernando Po, and *affinis* therefore becomes a junior synonym. The only important differences of any Afrotropical island population from mainland *T. alba* are to be found in the notably darker plumage and smaller size of *T. a. thomensis*. São Tomé is a long-isolated island of high endemism, unlike Fernando Po. Madagascar is also an area of endemism, but barn owls there must be a late arrival as *T. a. hypermetra* (Grote 1928) was considered to be inseparable from '*affinis*', although on average these populations are larger than mainland birds (cf. Benson 1963, Benson *et al.* 1976). However, recent indications that *hypermetra* may be valid also suggest a need to re-evaluate the taxonomic status of African populations of barn owls, e.g. compare the different treatments in Bruce (1999) and König *et al.* (1999).

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Range extensions and other noteworthy and new bird records from mainland Ecuador

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Bird species distribution in the Neotropics is still incompletely understood, with new distributional records and range extensions being regularly found. In addition, several species show patterns of seasonal, altitudinal or erratic movements that are still very poorly documented (see Joseph 1997).

In this note I present new localities for little-known species in Ecuador, including some globally or locally threatened (BirdLife International 2000, Granizo *et al.* 2002), as well as range and altitudinal extensions obtained from field work carried out in most of Ecuador's zoogeographic regions on a regular basis between 1996 and 2002 (Table 1, Fig. 1). The distribution and taxonomy of the species treated herein follow Ridgely & Greenfield (2001).

Birds were recorded through observations, mist-netting and tape-recording. Information on each study site is mentioned in the species accounts and details of the study sites are given in Table 1. Where appropriate, brief comments on the species' distribution, identification, taxonomy, natural history and conservation status are included as well. Further details on the species recorded, site lists and methods used are available directly from the author (see also Freile 2000). All of the observations presented in this paper pertain to the author unless otherwise noted. Photographs and tape-recordings are deposited in the archives of Fundación Numashir of Ecuador, and will be deposited in due course in the Library of Natural Sounds, Cornell University, and research permits for collecting at particular sites are held at Centro de Datos para la Conservación (see www.jatunsacha.org), at Fundación EcoCiencia (www.ecociencia.org), and at the Departamento de Biología, Pontificia Universidad Católica del Ecuador.

Species accounts

GREY TINAMOU *Tinamus tao*

At least four different individuals were heard (one of them tape-recorded) at Nueva Alianza, Morona-Santiago province, at 1,300–1,500 m elevation on 11–19 May 2002. Nueva Alianza lies adjacent to the extensively forested Sangay National Park. An additional record from Morona-Santiago is that of a female specimen collected by N. Krabbe at Unnsuants; 1,000 m elevation (MECN 7634), on 25 January 2002. Known from very few localities in Ecuador, these are the first records from Morona-Santiago province (Ridgely & Greenfield 2001) and suggest that its range is continuous along the east slope of the Andes.

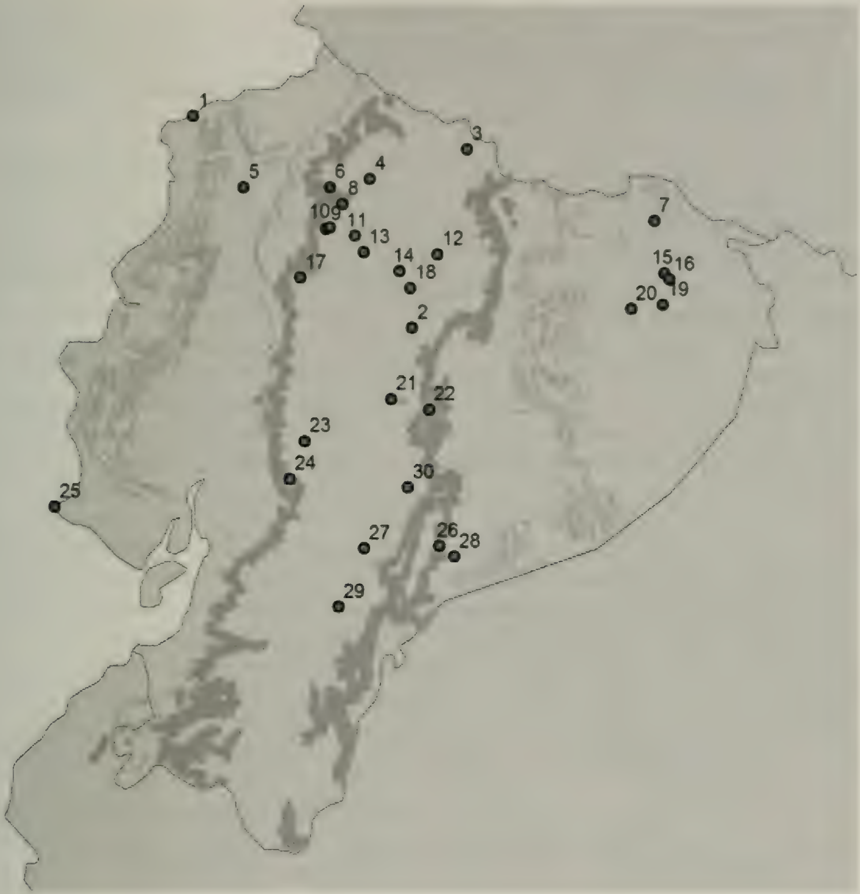

Figure 1. Map of Ecuador showing the study sites (circles and numbers). Numbers correspond to those mentioned in Table 1. Contour lines at 300 m (thin line) and 1,000 m elevation (broad line). Scale 1: 4,000.000.

GREY-HEADED KITE *Leptodon cayanensis*

An adult was observed flying over a forested area above Mindo, Pichincha province, at 1,500 m elevation on 28 March 1998. Previously known in Ecuador up to 900 m in El Oro province (Ridgely & Greenfield 2001). Kirwan & Marlow (1996) reported *L. cayanensis* in their review of Mindo bird records, but gave no further information. There is an additional unpublished sighting as high as 1,600 m, above Mindo (M. Tellkamp pers. comm.).

TABLE 1

Localities mentioned in the text, where bird species reported in this note were recorded (see Fig. 1).

	Localities, provinces	Co-ordinates	Altitude (m)
1	Atacames–Tonsupa area, Esmeraldas	00°52'N, 79°51'W	10
2	Cerro Golondrinas Reserve, Carchi	00°49'N, 78°07'W	1,900
3	Guandera Biological Station, Carchi	00°36'N, 77°41'W	3,600
4	Alto Chocó Reserve, Imbabura	00°22'N, 78°27'W	2,100
5	Finca Paraíso de Papagayos, Esmeraldas	00°18'N, 79°27'W	100
6	Los Cedros Reserve, Imbabura	00°18'N, 78°46'W	1,450
7	Laguna Grande, Cuyabeno Reserve, Sucumbíos	00°02'N, 76°12'W	220
8	Palmitopamba, Pichincha	00°10'N, 78°40'W	1,400
9	Mindo, Pichincha	00°02'S, 78°48'W	1,500
10	Tandayapa Valley, Pichincha	00°01'S, 78°46'W	1,800
11	Oyacachi, Napo	00°05'S, 78°34'W	3,000
12	Oyacachi–El Chaco road, Napo	00°14'S, 77°55'W	2,550
13	Parque Metropolitano, Quito, Pichincha	00°13'S, 78°30'W	2,900
14	Papallacta, Napo	00°22'S, 78°13'W	3,600
15	Pañacocha, Sucumbíos	00°23'S, 76°07'W	220
16	Confluence of río Pañayacu with río Napo, Sucumbíos	00°26'S, 76°05'W	200
17	Otonga Reserve, Cotopaxi	00°25'S, 79°00'W	1,750
18	Micacocha, Antisana Ecological Reserve, Napo	00°30'S, 78°08'W	3,800
19	Tiputini Biodiversity Station, Orellana	00°38'S, 76°08'W	200
20	Yasuni Research Station, Orellana	00°40'S, 76°23'W	220
21	Machay, Tungurahua	01°23'S, 78°17"W	1,800
22	Parque Omaere, Pastaza	01°28'S, 77°59'W	950
23	Cashca Totoras, Bolívar	01°43'S, 78°58'W	3,000
24	Tiquibuzo, Bolívar	02°01'S, 79°05'W	2,200
25	La Libertad, Guayas	02°14'S, 80°57'W	0
26	Unnsuants, Morona-Santiago	02°33'S, 77°54'W	1,000
27	Guarumales, Azuay	02°34'S, 78°30'W	1,750
28	Miazal, Morona-Santiago	02°38'S, 77°47'W	300
29	Fasañán, Azuay	03°02'S, 78°42'W	3,100
30	Nueva Alianza, Morona-Santiago	02°05'S, 78°09'W	1,500

TINY HAWK *Accipiter superciliosus*

One was observed and tape-recorded atop a *Cecropia* tree at a forest border at Tiputini Biodiversity Station, Orellana province, on 15 January 2000. It was giving a fast and agitated series of *klee-e, klee-e* calls (it also gave the same call described by Ridgely & Greenfield 2001), and had an antbird-sized bird in its claws. Another bird was observed at close range for *c.*5 minutes in primary forest edge at Yasuni Research Station, on 27 September 2001. Both localities are within Yasuni National Park. On 4 September 2000, at Miazal, Morona-Santiago province (trans-Kutukú region), 300 m elevation, two birds were also seen at a forest border perching at canopy level and giving a weak *cree-cree* call (see Ridgely & Greenfield 2001). There are few records of this species in Amazonian Ecuador (Ridgely & Greenfield 2001), where it appears to be a widespread, low-density resident (R. S. Ridgely pers. comm.).

MERLIN *Falco columbarius*

A single was observed at close range for up to 15 minutes above Papallacta, Napo province, at 3,600 m elevation on 28 January 2002, flying above páramo and actively chasing and attacking a flock of Brown-bellied Swallows *Notiochelidon murina*. At Guandera Biological Station, Carchi province, two individuals were observed on two separate occasions, on 1 and 3 February 2002, flying over páramo and adjacent elfin forest at 3,500–3,600 m elevation. This migrant raptor was previously reported up to 3,000 m (Ridgely & Greenfield 2001) and was not recorded at Guandera by Cresswell *et al.* (1999) (although their study was undertaken in July–September, when the species would not be present). D. Wolf (pers. comm. to R. S. Ridgely) also recorded this species above Papallacta on 16 January 2000, suggesting that it may be regular there.

WHIMBREL *Numenius phaeopus*

A single was observed at close range for several minutes at a swampy area in the páramo of Guandera Biological Station, Carchi province, at 3,600 m elevation. This species was previously recorded primarily from the coastal lowlands in Ecuador, with only a handful of records inland, including a single record from the highlands (Ridgely & Greenfield 2001). Confusion with other shorebird species is unlikely, as the long decurved bill and bold stripes in the crown are unique among other species occurring in Ecuador (Hayman *et al.* 1996, Ridgely & Greenfield 2001).

WHITE-RUMPED SANDPIPER *Calidris fuscicollis*

One was observed closely feeding at a sandy beach and in flight at the río Esmeraldas, below Finca Paraíso de Papagayos (3 km by road from Quinindé town), at *c.*100 m elevation, on 10 March 1998. It was identified in flight by its conspicuous white rump, a feature not present in any other sandpiper species that occurs regularly in Ecuador (Hayman *et al.* 1986, Ridgely & Greenfield 2001). Curlew Sandpiper *Calidris ferruginea*, an Old World species that has been recorded once in Ecuador (Ridgely & Greenfield 2001), has a long and slightly down-curved bill and long legs (protruding in flight) (Hayman *et al.* 1986), two features not shown by the observed bird. There are very few records of this species in Ecuador and none from the western lowlands (Ridgely & Greenfield 2001). As it does not winter in Ecuador (Ridgely & Greenfield 2001) this record probably involved a bird returning to its breeding grounds from southern South America (Hayman *et al.* 1986).

PECTORAL SANDPIPER *Calidris melanotos*

A flock of 4–5 was observed at a muddy area next to Micacocha Lake, Antisana Ecological Reserve, Napo province, at 3,800 m elevation, on 24 September 1997.

Identification was based on throat and breast streaking abruptly ending on the lower breast. One of the observers (P. Catry) had extensive experience with shorebird identification and confirmed its identity. Previously recorded up to 3,500 m in Ecuador (Ridgely & Greenfield 2001).

STILT SANDPIPER *Micropalama himantopus*
Two were observed in a flock including Greater *Tringa melanoleuca* and Lesser Yellowlegs *T. flavipes*, and Spotted *Actitis macularius* and Baird's Sandpipers *Calidris bairdii*, at Micacocha Lake, Antisana Ecological Reserve, Napo province, at 3,800 m elevation, on 24 September 1997. All were feeding along a muddy beach and floating vegetation of this lake. The Stilt Sandpipers were identified by their long whitish superciliary stripes, long slightly curved bill and long greenish legs (Hayman *et al.* 1986, Ridgely & Greenfield 2001). Previously known from two other Andean localities in Ecuador up to 3,500 m (Ridgely & Greenfield 2001).

WILSON'S PHALAROPE *Phalaropus tricolor*
Three were observed feeding on floating vegetation at Micacocha Lake, Antisana Ecological Reserve, Napo province, at 3,800 m elevation, on 24 September 1997. This species was previously reported up to 3,500 m in Ecuador (Ridgely & Greenfield 2001). Subsequently, this area has been dammed, a change that will probably reduce the number of visiting migrant shorebird species, as well as of resident waterbirds in the near future (e.g. Silvery Grebe *Podiceps occipitalis*, Black-faced Ibis *Theristicus melanopis*) that were associated with this lake (however see Muñoz & Olmedo 2001).

RED-AND-GREEN MACAW *Ara chloropterus*
A flock of five was observed over primary forest and forest border above Tiputini River, at Tiputini Biodiversity Station, Yasuni National Park, at 250 m elevation, on 17 January 2000. Another flock of four was observed flying over Pañacocha Lake and adjacent primary forest, Sucumbíos province, at a similar altitude, on 25–26 January 2000. *Ara chloropterus* is seemingly declining in Ecuador with only few recent records, and an apparent absence from seemingly adequate habitat (Ridgely & Greenfield 2001, Ribadeneira 2002).

GOLDEN-PLUMED PARAKEET *Leptosittaca branickii*
Two flocks of *c.*10 individuals in each were recorded daily (one of them was tape-recorded) at Fasañán (upper río Shiu), Azuay province, between 2,900 and 3,100 m elevation, on 16–21 December 1999. Forest at these altitudes is fairly continuous at Fasañán, and comprises at least 600 ha (Freile 2000). There is a good number of recent records of this threatened species in southern Ecuador, which apparently engages in seasonal migrations (Ridgely & Greenfield 2001). These latter authors suggest that *L. branickii* is probably not so gravely at risk, but its geographic restriction, nomadic behaviour and the fact that during breeding the species becomes very

local and vulnerable to poaching should be taken into account to better assess its conservation status (Jácome 2002, N. Krabbe pers. comm.).

RED-FACED PARROT *Hapalopsittaca pyrrhops*
A pair was observed on two separate days flying above montane forest and adjacent clearings at Fasañán, Azuay province, at 3,000 m elevation, on 17 and 19 December 1999. The species is known from a handful of sites in southern Ecuador, and is threatened by intense deforestation throughout its small range (BirdLife International 2000, Ridgely & Greenfield 2001). For natural history information see Toyne *et al.* (1995) and Toyne & Flanagan (1997).

RED-BILLED PARROT *Pionus sordidus*
A single bird was observed flying above forested and cleared areas at Cashca Totoras, Bolívar province, at 2,900–3,000 m elevation, on 7 September 1999. It was readily identified from White-capped Parrot, *Pionus seniloides*, the only other parrot species recorded at this site, by its uniformly green-coloured plumage, red vent and reddish bill (Ridgely & Greenfield 2001). It was not seen during the following days, suggesting that it was only passing through the area. However, three additional birds were observed by E. Bonaccorso in July 2003. It was previously reported up to 2,600 m in the eastern slope of the Andes in Ecuador (Ridgely & Greenfield 2001). There are some other records of local migrations in this species (Forshaw & Cooper 1977) but it has also been suggested that it is poorly adapted for long-distance daily movements (Collar 1997).

BAND-BELLIED OWL *Pulsatrix melanota*
Up to five individuals were heard, seen and tape-recorded at primary forest borders and adjacent clearings with tall standing trees in Nueva Alianza, Morona-Santiago province, at 1,300–1,500 m elevation, on 11–19 May 2002. This owl was previously unrecorded from the central portion of the eastern Andean slope, and this record helps partially to fill this discontinuity (Ridgely & Greenfield 2001).

SHORT-EARED OWL *Asio flammeus*
One was observed during late afternoon perching on a fence post and flying over agricultural fields for *c.*20 minutes in Tiquibuzo, Bolívar province, at 2,200 m altitude, on 31 October 1999. Previously recorded mostly between 3,000 and 4,000 m along the Andes of Ecuador (Ridgely & Greenfield 2001).

COLLARED INCA *Coeligena torquata*
Four were observed feeding on an unidentified Rubiaceae sp. and chasing other hummingbirds inside secondary forest above Machay, Tungurahua province, at 1,800 m elevation, on 5–9 August 1999. Previously recorded mostly between 2,100 and 3,000 m (Krabbe *et al.* 1998, Ridgely & Greenfield 2001), but now regularly found down to 1,750 m at Tandayapa, Pichincha province, mainly at bird feeders (R. S. Ridgely pers. comm.). Furthermore, at least three individuals were observed in

secondary forest and at forest borders in Tiquibuzo, Bolívar province (2,200 m), on 30 October–3 November 1999. Recent records of this species in western Ecuador are restricted to the north (south to Cotopaxi province, Ridgely & Greenfield 2001).

EMERALD TOUCANET *Aulacorhynchus prasinus*
Heard and seen within secondary forest and forest borders above Machay, Tungurahua province, at 1,600–1,800 m elevation, on 5–9 August 1999. Birds showed a contrasting whitish throat and yellow central stripe on their bills, two features that distinguish the race *albivitta*, of northern Ecuador and eastern Colombia, from the southern race *cyanolaemus* (Ridgely & Greenfield 2001). This record extends the currently known range of *albivitta* by *c*.60 km south to the northern side of the Pastaza River depression, and fills an apparent discontinuity in the distribution of *A. prasinus* (Ridgely & Greenfield 2001). The río Pastaza appears to constitute a distributional barrier for some Andean taxa (e.g. Moustached Antpitta *Grallaria alleni*, Handsome Flycatcher *Myiophobus pulcher*; see Krabbe *et al.* 1998), and it also separates the ranges of subspecies that may actually represent valid species (e.g. *Metallura williami*, see Krabbe *et al.* 1998, Ridgely & Greenfield 2001). It seems plausible that the río Pastaza also separates the races of *A. prasinus*, but confirmation of which race occurs in the intervening area between Tungurahua and Morona-Santiago provinces is needed. As suggested by Ridgely & Greenfield (2001) and Navarro *et al.* (2001) this species with many allopatric taxa may prove to be separable into different valid species.

BLACK-BILLED MOUNTAIN-TOUCAN *Andigena nigrirostris*
A group of five was observed daily at a campsite in Oyacachi–El Chaco road, Napo province, at 2,550 m elevation on 17–22 February 1997. Grey-breasted Mountain-toucan *A. hypoglauca* was not recorded at the site. *A. nigrirostris* was previously known up to 2,300 m altitude, above which it is replaced by Grey-breasted Mountain-toucan (Krabbe *et al.* 1998, Ridgely & Greenfield 2001).

CHANNEL-BILLED TOUCAN *Ramphastos vitellinus*
Two were heard, seen and tape-recorded at a primary forest border in Nueva Alianza, Morona Santiago province, at 1,500 m elevation, on 18 May 2002. This Amazonian species has been found as high as 1,400 m in the Cordillera de Kutukú and locally up to 1,100 m along the Andean foothills (Ridgely & Greenfield 2001).

CHESTNUT-MANDIBLED TOUCAN *Ramphastos swainsonii*
Two were observed and heard daily at a campsite located in secondary forest at 1,400 m elevation in Palmitopamba, north-west of Nanegal, Pichincha province, on 22–26 July 1996. Additionally, several were observed in secondary forest, forest borders and adjacent clearings with tall standing trees in Los Cedros Reserve, Imbabura province, at 1,400–1,500 m elevation, on 17–23 May 1999. Ridgely & Greenfield (2001) reported old records at similar altitudes in the north-west, but gave recent records only as high as 1,000 m, in south-western Ecuador.

OLIVACEOUS PICULET *Picumnus olivaceus*
One was observed at close range feeding along vines and small trees in secondary forest at 1,400 m elevation in Palmitopamba, north-west of Nanegal, Pichincha province, on 24 July 1996. Previously recorded mainly below 900 m (Ridgely & Greenfield 2001).

LINED ANTSHRIKE *Thamnophilus tenuepunctatus*
Several were heard, seen and tape-recorded at secondary forest, forest borders, gardens and shrubs in adjacent clearings in Guarumales (Hidropaute Company Camp), Azuay province, at 1,750 m elevation, on 2–7 December 1999. Previously known to occur mostly below 1,400 m (Rassmusen & Rahbek 1994, Ridgely & Greenfield 2001), with small numbers up to 1,650–1,700 m in Zamora-Chinchipe (R. S. Ridgely pers. comm.). Ridgely & Greenfield (2001) suggested that this species may be spreading upslope following deforestation.

WHITE-BACKED FIRE-EYE *Pyriglena leuconota*
A male was mist-netted and collected in Palmitopamba, north-west of Nanegal, Pichincha province, on 25 July 1996, at 1,450 m elevation. The specimen was deposited at the Zoology Museum of the Departamento de Biología, Pontificia Universidad Católica del Ecuador (QCAZ 1289). In the western Andes of Ecuador *P. leuconota* had not previously been recorded above 1,350 m, at nearby Maquipucuna Reserve (Ridgely & Greenfield 2001).

SPOTTED TODY-FLYCATCHER *Todirostrum maculatum*
One was observed closely for *c.*5 minutes in an *Inga* sp. planted tree in the gardens of Yasuni Research Station, Orellana province (250 m elevation), on 20 January 2000. Another was observed and tape-recorded in a garden bush in Pañacocha, Sucumbíos province (*c.*250 m), on 23 January 2000. It was readily identified by the spotted pattern on the white throat and yellow breast and sides, and by the contrasting grey head and conspicuous pale orange iris (Ridgely & Tudor 1994, Ridgely & Greenfield 2001). These authors mentioned that in Ecuador *T. maculatum* has been recorded only on river islands and riparian woodland along the lower section of the Napo, Aguarico and Pastaza rivers. My records might represent dispersing or wandering individuals, which had followed the courses of small tributaries of the Napo River (Tiputini and Pañayacu), or that the species is beginning to spread into anthropogenic habitat (R. S. Ridgely pers. comm.).

PIED WATER-TYRANT *Fluvicola pica*
One was observed on a sandy shore and adjacent vegetation at the confluence of the Pañayacu with the Napo, Sucumbíos province, on 30 January 2000. The black-and-white plumage pattern was conspicuous and distinctive. There is only one previous record in Ecuador, also from along the Napo but several km upstream, in the Jatun Sacha area (Ridgely & Greenfield 2001). Its status here remains uncertain.

YELLOW-BELLIED CHAT-TYRANT *Ochthoeca diadema*

A single was observed and tape-recorded in secondary forest undergrowth dominated by bamboo in Tiquibuzo, Bolívar province (2,200 m elevation), on 2 November 1999. On the western slope of the Andes the species has been recorded south to Cotopaxi province in the north, and locally in the south-west, in Azuay province (Ridgely & Greenfield 2001). Tiquibuzo is located *c.*120 km north of the Azuay site and *c.*140 km south of western Cotopaxi, but this record accords with the range estimation given by Krabbe *et al.* (1998), and helps to fill the apparent gap between the two areas (its distribution is probably continuous in appropriate habitat).

STRIPED MANAKIN *Machaeropterus regulus*

A female was mist-netted and photographed within secondary forest in Parque Omaere (near El Puyo), Pastaza province, at 950 m elevation, on 13 November 1999. This Amazonian manakin has been reported up to 1,000 m in the south-east (Cordillera de Kutukú), but in the north it is not usually found above 700 m (Ridgely & Greenfield 2001). This is the highest record from north of the Pastaza River.

BEAUTIFUL JAY *Cyanolyca pulchra*

A group of six was observed and tape-recorded inside secondary forest along a creek in the Cerro Golondrinas Reserve, Carchi province, at 1,900 m altitude, on 2 June 1999. This restricted-range and Near-Threatened species is known from only a few localities in Ecuador, and is apparently declining (Ridgely & Greenfield 2001, Greenfield 2002).

RED-EYED VIREO *Vireo olivaceus*

Three different observers (J. A. Chaves, P. Castañeda and the author) observed a group of three birds during the morning of 22 March 2002 in Quebrada Ashintaco, Parque Metropolitano, Quito, Pichincha province, at 2,900 m elevation. They were feeding and moving conspicuously among shrubby vegetation. They were not observed subsequently, so they probably represented the boreal migrant *olivaceus* race, which is the only subspecies of *V. olivaceus* recorded in the highlands of Ecuador (Ridgely & Greenfield 2001). There is a single highland record from southern Ecuador, and it has not been previously found in the Quito area (Ridgely & Greenfield 2001).

BLACK-BILLED THRUSH *Turdus ignobilis*

Several were observed along forest borders and open areas around Machay town, Tungurahua province, at 1,600 m elevation, on 5 August 1999. On 2–7 December 1999, in Guarumales, Azuay province (1,750 m), several were also seen and heard in open areas, gardens and adjacent secondary forest. Previously recorded up to 1,200 m, but as this species is capable of quickly colonising recently cleared areas it is not unexpected to find it at open areas above this elevation (Ridgely & Greenfield 2001).

SOUTHERN ROUGH-WINGED SWALLOW *Stelgidopteryx ruficollis*
Singles, small groups and large flocks of this species have been recorded at altitudes above those reported by Ridgely & Greenfield (2001). Records come from Cerro Golondrinas Reserve (1,700–1,800 m), Bellavista Reserve (1,800 m), Tandayapa Bird Lodge (1,700 m), Mindo Biological Station (1,700 m) and Otonga Reserve (1,700–1,800 m). As this species is capable of long flights, and is also typical of cleared areas, it may be spreading upslope following deforestation.

GRASS WREN *Cistothorus platensis*
At least two were heard and seen in artificial pastures at 1,900 m elevation above Guarumales Camp, Azuay province, on 2 December 1999. The species is known to occur mostly above 2,800 m, with a few records down to 2,200 m (Loja–Zamora road) (Ridgely & Greenfield 2001). Considering the extent of pastureland along the road from Paute through Guarumales (pers. obs.), it seems plausible that this species is spreading downslope following deforestation.

TENNESSEE WARBLER *Vermivora peregrina*
One was mist-netted and released in a shrubby creek surrounded by planted Eucalyptus *Eucaliptus globulus* trees in Parque Metropolitano, outside Quito, Pichincha province, at 2,900 m elevation, on 6 March 2002. This migrant species has been previously reported from a single inter-Andean locality (San Pablo Lake) and at present is mostly known from the western slope of the Andes, in the Mindo area (Ridgely & Greenfield 2001), with an additional recent record from Bombuscaro, Podocarpus National Park, Zamora-Chinchipe province (N. Athanas pers. comm. to R. S. Ridgely).

AMERICAN REDSTART *Setophaga ruticilla*
Several were observed and heard giving soft *scheet* calls in secondary forest and adjacent gardens in Parque Omaere (near El Puyo), Pastaza province, at 950 m elevation, on 11–14 November 1999. In eastern Ecuador *S. ruticilla* is known to occur along the entire base of the Andes (Ridgely & Greenfield 2001), although the distribution map in this work does not include the area.

CANADA WARBLER *Wilsonia canadensis*
One was mist-netted and photographed in a regenerating scrubby area adjacent to secondary forest at a campsite on the Oyacachi–El Chaco road, Napo province, at 2,550 m elevation, on 19 February 1997. Previously recorded from both sides of the Andes up to 2,000 m (Ridgely & Greenfield 2001).

BUFF-RUMPED WARBLER *Basileuterus fulvicauda*
Three were observed in shrubby vegetation along a small stream in secondary forest at *c.*1,600 m elevation in the Cerro Golondrinas Reserve, Carchi province, on 1 June 1999. It had previously been recorded only below 1,000 m (Ridgely & Greenfield 2001).

CHESTNUT-VENTED CONEBILL *Conirostrum speciosum*
One male was observed for *c.*5 minutes in a primary forest border at Laguna Grande Lake, Cuyabeno Faunistic Reserve, Sucumbíos province, 220 m elevation, on 14 September 1996. It was identified by its bluish-grey plumage with a conspicuous chestnut vent and by the small whitish spot in the wing (which was fairly conspicuous in the individual observed) (Hilty & Brown 1986). Confusion with other passerines was unlikely (see Hilty & Brown 1986, Ridgely & Greenfield 2001). There is only a handful of previous records in Ecuador, all of them above 400 m elevation, near the base of the Andes (Ridgely & Greenfield 2001). It is regular around and just above the town of Zamora, often feeding in *Inga* sp. trees (R. S. Ridgely pers. comm.). This species was reported as a rare inhabitant at the margins of lakes in the Cuyabeno area by Paz y Miño (1989); however he did not provide any further details of his observations. This record is the first modern report away from the Andean foothills.

GOLDEN-RUMPED EUPHONIA *Euphonia cyanocephala*
A group of three was observed at close range accompanying a mixed-species flock, mainly of tanagers, in a shrubby area in Oyacachi town, Napo province 3,000 m elevation, on 15 February 1997. This report represents the highest elevation at which this species has been recorded in Ecuador (R. S. Ridgely pers. comm.). This handsome euphonia occurs mostly along the west slope of the Andes and the inter-Andean valleys, with only scattered records from the eastern slope (Ridgely & Greenfield 2001). Eastern records come from areas altitudinally below Oyacachi (San Isidro, Valladolid, Machay; Ridgely & Greenfield 2001).

BLACK-CAPPED TANAGER *Tangara heinei*
A pair was observed feeding at an isolated Moraceae tree in a degraded area close to secondary forest, and attending a nest in the same tree, in Alto Chocó Reserve (on the road to Intag), Imbabura province, at 2,100 m elevation, on 16–20 June 1999. I was unable to see if the nest already contained eggs or nestlings, but nest material (small thin twigs) was frequently transported by both birds to the nest site. The species has been recorded from a few sites in western Ecuador, all of them recent, mostly between 1,100 and 1,900 m elevation (Ridgely 1980, Ridgely & Greenfield 2001).

SILVER-BEAKED TANAGER *Ramphocelus carbo*
Several were observed along forest borders, clearings and gardens at two sites in the eastern slope of the Andes: Machay town, Tungurahua province, at *c.*1,600 m

elevation, on 5 August 1999, and Guarumales Camp, Azuay province, at 1,700 m, on 2–7 December 1999. Previously recorded up to 1,300 m in western Napo (Ridgely & Greenfield 2001). It has also been recorded in recent years up to 1,600 m in Valladolid, Zamora-Chinchipe province (R. S. Ridgely pers. comm.). This species is capable of rapidly colonising recently cleared areas, and its presence at both sites reported here is not surprising.

RED-HOODED TANAGER *Piranga rubriceps*
Two were observed at a secondary forest gap close to a forest border, at 1,700 m elevation, above Machay, Tungurahua province, on 7 August 1999. This striking tanager has been recorded mostly between 2,200 and 3,000 m altitude and seems to occur continuously along the eastern slope of the Andes in Ecuador (Krabbe *et al.* 1998, Ridgely & Greenfield 2001).

BLACK-EARED HEMISPINGUS *Hemispingus melanotis ochraceus*
One was mist-netted and photographed in secondary forest dominated by bamboo in the Cerro Golondrinas Reserve, Carchi province, at 2,000 m altitude, on 4 June 1999. The species is known from very few sites in north-west Ecuador, all of them from Pichincha south to Azuay province (Ridgely & Greenfield 2001). The present site is *c.*80 km north of previously known sites, but is in accordance with the estimated geographic range made by Krabbe *et al.* (1998). My record also partially fills the apparent discontinuity between Pichincha and south-west Colombia, where it has also been found (Hilty & Brown 1986). The race *ochraceus* was recently proposed to represent a separate species (Ridgely & Greenfield 2001), but molecular data do not support this assumption (García-Moreno *et al.* 2001, 2003).

ROSE-BREASTED GROSBEAK *Pheucticus ludovicianus*
One was observed within a mixed-species flock in a shrubby area adjacent to secondary forest in Guarumales Camp, Azuay province, at 1,750 m altitude, on 5 December 1999. Records of this migrant species come mostly from western Ecuador, with only a few reports from the eastern slope of the Andes (Ridgely & Greenfield 2001).

YELLOW-FACED GRASSQUIT *Tiaris olivacea*
A group of *c.*5 individuals was observed on 11–14 September 1999, in the Atacames-Tonsupa area, Esmeraldas province. This is the first record from coastal Ecuador (Ridgely & Greenfield 2001). The species, considered a recent arrival by Ridgely & Greenfield (2001), seems to be spreading in western Ecuador following deforestation and will probably be encountered in other areas further south, west and north.

LESSON'S SEEDEATER *Sporophila bouvronides*
Flocks of up to seven (males and female-plumaged birds) were observed in small pastures along the Maxus Road, Yasuni National Park, Orellana province, at the

following sites: Capirón, YPF Camp, Amo-C Camp and Yasuni Research Station, in June 1998 and 2000. The status of this intratropical migrant species in Ecuador is still poorly known, with only a few scattered records mostly from November to April (Ridgely & Greenfield 2001). The records reported here are anomalous, as is the August record mentioned by Ridgely & Greenfield (2001). Although *S. bouvronides* can easily be confused with *S. lineola* (Lined Seedeater), none of the males observed had the white coronal stripe typical of the latter species (see Hilty & Brown 1986, Ridgely & Greenfield 2001).

YELLOW-BROWED SPARROW *Ammodramus aurifrons*

Several were seen and tape-recorded at clearings and gardens in Guarumales Camp, Azuay province, at 1,750 m altitude, on 2–7 December 1999. This species seems to be spreading to Andean slopes following deforestation, as it is able to colonise newly cleared areas quickly (Ridgely & Greenfield 2001). It has previously been recorded up to 1,600 m, and even to 2,500 m as a wanderer (Ridgely & Greenfield 2001). At present it is also common around Valladolid, Zamora-Chinchipe province, at 1,600 m elevation (R. S. Ridgely pers. comm.).

GREAT-TAILED GRACKLE *Quiscalus mexicanus*

Groups and singles were observed at La Libertad town, Guayas province, on the Santa Elena Peninsula, on 28–31 August 2001. Previous records in western Ecuador were restricted to areas where mangroves are still extensive (Ridgely & Greenfield 2001), and these authors mentioned that in the Santa Elena Peninsula it does not occur at all. The birds observed were probably dispersing from other areas further north or, even more likely, this species is beginning to colonise anthropogenic areas, as it does in other countries.

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First Palearctic record of the endangered Bermuda Petrel *Pterodroma cahow*

by Joël Bried & Maria C. Magalhães

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Many Procellariiformes make regular long-distance movements at sea (up to several thousands of km) during both breeding and non-breeding periods (González-Solís *et al.* 2000, Weimerskirch *et al.* 1999, Weimerskirch & Wilson 2000). The Bermuda Petrel *Pterodroma cahow*, endemic to Bermuda (in the subtropical north-western Atlantic), is classified as Endangered according to IUCN Red List criteria (BirdLife International 2000), with a few tens of breeding pairs (BirdLife International 2000, Madeiros 2002). Its movements during the non-breeding period are poorly known, dispersal being supposed to occur towards the north or the north-west in the subtropical western Atlantic (del Hoyo *et al.* 1992), as far as off North Carolina (Wingate *et al.* 1998). Here, we report the first record of a Bermuda Petrel in the Palearctic.

On 17 November 2002, during the daytime, MCM incidentally captured a gadfly petrel (genus *Pterodroma*) in a burrow on an offshore islet free of introduced predators, in the Azores archipelago. The bird was ringed using an individually numbered metal ring, measured and photographed (Figs. 1–3). Measurements taken were: wing length (flattened chord) using a stopped ruler correct to 1 mm; tarsus length; bill (exposed culmen length, bill depth at gonys, bill depth at nostrils) and total head length (head plus bill) using a vernier calliper (to 0.1 mm). A 100-ml blood sample was also taken (under license) for future genetic studies. The bird was released into its burrow after handling.

The following description was taken. **Upperparts** dark to medium grey, gradually becoming blackish grey on nape and crown (Figs. 1 and 2); tail also dark grey but uppertail-coverts formed a narrow pale creamish, rather than greyish, crescent; forehead white with few black mottlings, the white almost extending to eyes; lores black near eye, white near bill and gape; ear-coverts black (Fig. 1). **Underparts** from chin to undertail-coverts, and flanks, pure white; sides of breast grey, but grey markings did not join to form a collar; no brood patch. **Wings**—upperwing dark grey without obvious markings (Fig. 2); axillaries white, marginal and lesser underwing-coverts blackish; lesser under secondary-coverts formed broad dark bar along forearm; median underwing-coverts white; greater underwing-coverts white but some dark spots visible in subterminal position on the greater

TABLE 1

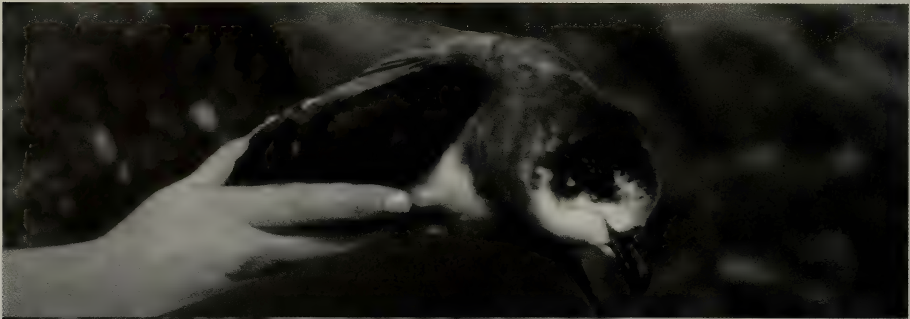
Measurements of *Pterodroma cahow*, *P. feae* and *P. mollis*. Mean values (and ranges in brackets) are given. All values are expressed in mm.

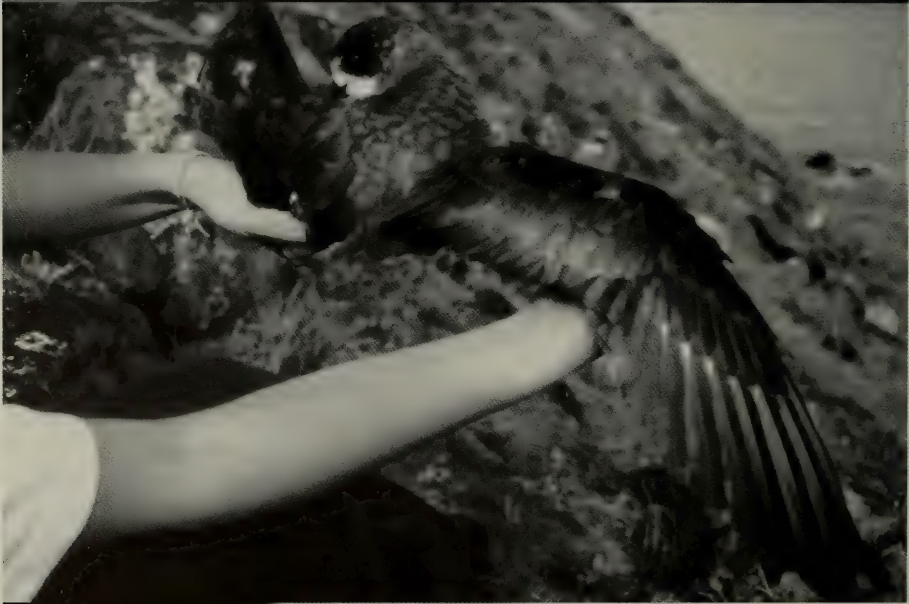
	P. cahow (Azores)	*P. cahow* (Bermuda)	*P. cahow* (Bermuda)	*P. feae* (Azores)	*P. feae* (Bugio)	*P. feae* (Bugio)	*P. mollis dubia* (Crozet)
Wing	269[1]	260.7 (260–262)[2]	(245–265)	269.75 (269.5–270)	267.8 (258–282)	266.4 (262–270)	248.2 (244–252)
Tail	–	120.9 (118–123.8)	–	120 (112–128)	110.3 (106–155)	108.5 (102–111)	112.2 (108–116)
Tarsus	35.9	35.4 (34.4–37.3)	–	35.3 (35.0–35.6)	35.8 (32.0–41.0)	35.9 (34.3–38.2)	36.8 (33.7–39.6)
Culmen	28.3	28.6 (27.4–29.6)	28.1 (25.7–30.4)	29.1 (28.5–29.7)	29.1 (27.0–31.0)	28.4 (27.2–29.9)	28.4 (27.1–29.3)
Gonys	12.2	–	11.6 (10.7–12.3)	12.8	–	12.4 (11.2–13.2)	11.3 (10.3–12.0)
Nostrils	14.0	–	12.4 (11.1–13.3)	15.0	14.6 (13.0–16.2)	14.3 (13.4–15.6)	13.0 (12.1–14.8)
Total head	75.6	–	–	73.1	–	72.4 (71.3–73.3)	73.1 (72.2–75.1)
Middle toe plus claw	–	47.1 (46.2–49.0)	–	–	–	–	–
Sample size	1	3	8–11	1–2	29–40	3–5	4–11
Source[3]	1	2	3	4, 5	6	1	1

[1] Flattened wing chord.

[2] The sample included a fledgling.

[3] 1: this study (*P. feae* and *P. mollis* specimens are from the Muséum National d'Histoire Naturelle de Paris); 2: Murphy & Mowbray (1951, specimens); 3: Wingate *et al.* (1998, specimens); 4: Bibby & del Nevo (1991, live bird); 5: Monteiro & Furness (1995, live bird); 6: Zino & Zino (1986, live birds).





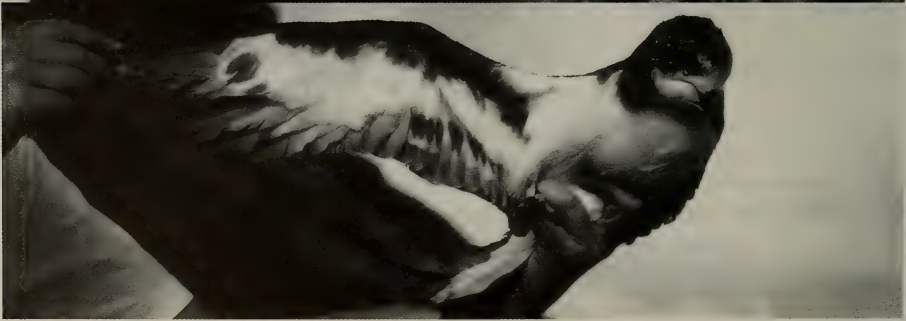


Figure 1. Side view of the Bermuda Petrel captured in the Azores (J. Bried)
Figure 2. Upperparts of the same individual (J. Bried)
Figure 3. Underparts of the same individual (J. Bried)

under secondary-coverts and outermost greater under primary-coverts (Fig. 3). **Legs** pink; toes and webs with proximal third pink and distal two-thirds black, except for entirely black outer toe. **Bill** black with moderately arched maxillary unguis.

This bird was clearly larger than Madeiran Petrel *P. madeira* (see Monteiro & Furness 1995, p. 11) and slightly larger than Subantarctic Soft-plumaged Petrel *P. mollis dubia*, but similar in size to Fea's Petrel *P. feae* (Table 1). Its measurements fell at the upper range limit for Bermuda Petrel specimens (Table 1), but well within the range of the values obtained from 12 live adults (J. L. Madeiros pers. comm.).

The plumage characters of this bird, especially the underwing pattern with the dark 'thumb print' mark on the outer greater under primary-coverts and the pale band at the base of the tail (Wingate *et al.* 1998), its measurements, and its more slender bill than in Fea's Petrel (see, e.g. photograph in Monteiro & Furness 1995), confirmed it as *Pterodroma cahow*.

This individual seemed robust and healthy. Although not weighed, a manual inspection showed that it was carrying fat reserves and had no apparent ectoparasites. The petrel was recaptured in the same burrow on 21 November 2002 at *c.*22.00 h by JB after uttering a moaning call, apparently in response to the vocalisations of a Little Shearwater *Puffinus assimilis baroli* in a neighbouring burrow. After we checked the ring number, the bird was again released into its burrow. During another visit to the islet on 31 January 2003, JB found the burrow empty and did not find Bermuda Petrels in any neighbouring burrows.

Discussion

Our capture of a Bermuda Petrel on 17 November 2002 represents, to the best of our knowledge, the first proven record of this species for the Palearctic. In addition, the recapture of this individual in the same burrow four days later suggests that it exhibited some level of site tenacity. The burrow was situated on a slope oriented eastwards, *c.*20 m above sea level.

When breeding, Bermuda Petrels return ashore at the onset of the pre-laying period in late October and November; most eggs are laid during the first fortnight of January and chicks fledge in late May and June (Palmer 1962, del Hoyo *et al.* 1992). The Azorean individual was thus occupying a burrow at the same period as its pre-laying conspecifics in Bermuda. This behaviour, together with its fat reserves, suggests that it was in pre-laying condition as well. In addition, its behaviour and its measurements (within the top 20% of the range) made it likely that it was a male (J. L. Madeiros & D. B. Wingate pers. comm.); however, this still needs confirmation through blood analyses. The scarcity of at-sea observations of Bermuda Petrel (Wingate *et al.* 1998) makes it impossible to know whether or not the Azores area is part of the normal range of this species.

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Further comments on the avifauna of the middle São Francisco Valley, Minas Gerais, Brazil

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Santos D'Angelo Neto & Ignacio Roesler

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In earlier contributions (Kirwan *et al.* 2001, Raposo *et al.* 2002, Whitney *et al.* 2003) GMK, JMB and others drew attention to the highly threatened avifauna of the middle reaches of the rio São Francisco in eastern Brazil, and the river's importance in influencing biogeographical processes of avian speciation and endemism. We also presented notes on behavioural aspects of a number of poorly known species, and provided new southernmost records for several north-east Brazilian caatinga specialists. Details of our principal study sites were included in the earlier paper. Since then we have made further visits to the area, resulting in additional data substantially augmenting our previous field work. Here, our intention is only to supply details of those records that update our knowledge of the Minas Gerais avifauna, along the middle reaches of the São Francisco Valley. Systematic order and scientific nomenclature follow Sick (1997), with all departures from this explained in Kirwan *et al.* (2001).

Methods

All tape-recordings were made using Sony TCM-5000 EV tape recorders and Sennheiser ME-66 microphones, and will be deposited at the Arquivo Sonoro Prof. Elias Coelho (ASEC), Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

Several 'new' localities were visited and details of these are presented below (see also Fig. 1). Coordinates were taken from GPS readings or estimated from a map.

Rio Lavado (17°58'S, 44°34'W), Lassance municipality: a patch of gallery forest within an area of altered *cerradão* (closed-canopy, dense woodland), south of Lassance, visited briefly on 9 January 2003.

Lassance (17°54'S, 44°34'W), Lassance municipality: an area of cerrado and *Mauritia* palm *veredas* surrounding the city was visited on 2 February 1997.

Fazendas Jatobá do Cotobelo and **Jatobá da Mata** (centred at 17°45'S, 44°42'W), Várzea da Palma municipality: possess areas of *cerradão* woodland, open areas with caatinga influence, and gallery forest, as well as wetlands and agricultural fields. Active carbon ovens were noted in the area. Visited on 10 January 2003.

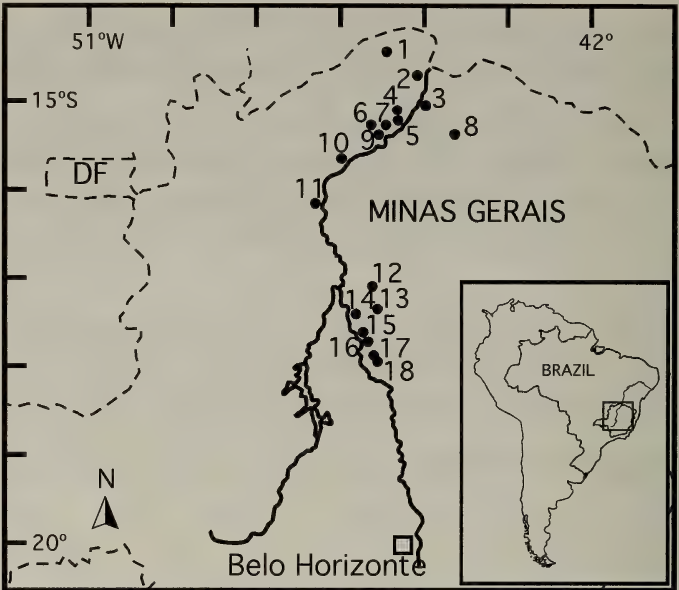

Figure 1. Map of the study localities in northern Minas Gerais. 1. Faz. Nova União; 2.Japoré; 3. Mocambinho; 4. Peruaçu; 5. Levinópolis; 6. Brejo do Amparo; 7. Januaria (10 km north of); 8.Poço da Vovó; 9. Pesqueiro Itambé; 10. rio São Francisco; 11. Faz. Buriti; 12. Curral de Pedras; 13. Serra Boqueirão; 14. Pirapora (south of); 15. Cia Florestal; 16. Faz. Jatobá do Cotovelo and Faz. Jatobá da Mata; 17. Lassance; 18. rio Lavado.

Companhia Florestal at Várzea da Palma (centred at 17°40'S, 44°44'W), Várzea da Palma municipality: road south and west of the town, that passed through a forestry plantation (mainly *Eucalyptus*), and continued through areas of degraded *cerradão*, open areas with influence of caatinga, and several tracts of gallery forest. Visited on 10 January 2003.

Pirapora (south of) (centred at 17°25'S, 44°48'W), Pirapora municipality: an area crossed by several minor roads south of the town, through caatinga–*cerradão* transition habitats, open agricultural fields and a few remaining patches of tall woodlands. Visited on 11 January 2003.

Serra do Boqueirão (17°23'S, 44°32'W), Jequitaí municipality: rocky escarpment between Jequitaí and Várzea da Palma, accessed via a minor road. The area presents mostly degraded woodland and *cerradão* habitats, agricultural fields, and taller woodland along the base of the serra. There is a large marshy area, as well as a number of small streams with narrow belts of gallery forest. Accessed from Jequitaí on 11 January 2003.

Curral de Pedras (17°06'S, 44°35'W), Jequitaí municipality: north-east of Pirapora inland of the right bank of the São Francisco, accessed from Jequitaí. The name, 'curral de pedras', refers to a limestone formation, which appears labyrinthine due to a series of concentric circles in the rock, and in this case is surrounded by reasonably well-preserved semi-deciduous dry forest. It was visited in late-November 1995.

Fazenda Buriti (16°08'S, 45°09'W), Pintópolis municipality: area of *cerrado* and pastures. Visited on 17 June 2002.

São Francisco river (*c*.15°37'S, 44°28'W), Januária municipality: 15–20 km south of Januária, along a dirt road parallel to the left margin of the river. It contains dense scrub, inundated areas and patches of tall gallery woodlands. It was visited on 10 February 2002, and on 13 and 15 January 2003.

Brejo do Amparo (15°29'S, 44°22'W), Januária municipality: a well-known locality (Snethlage 1928, Willis & Oniki 1991), *c*.10 km west of Januária. We briefly surveyed the tall woodlands and fields along the rocky escarpments west of this locality, on 12 January 2003.

Januária (north of; *c*.15°25'S, 44°35'W), Januária municipality: access roads to the 'Escola Agrotécnica', where areas of scrub among agricultural land, and patches of tall woodlands were surveyed on 14 January 2003.

Poço da Vovó (15°22'S, 43°37'W), Jaíba municipality: region of second-growth caatinga woodlands and pastures. It was visited on 7 July 2002.

Pesqueiro Itambé (15°21'S, 44°11'W), Januária municipality, is located close to Riacho da Cruz village, at the left margin of rio São Francisco. Typical habitats are second-growth gallery forest, and riverbanks. This area was surveyed on 27–28 April 2002.

Levinópolis (*c*.15°15'S, 44°17'W), Levinópolis municipality: area west of town, along a local road, through limestone escarpments with mostly low-stature (possibly degraded) semi-deciduous woodlands. Visited on 14 January 2003.

Japoré (14°42'S, 44°04'W), Manga municipality: second-growth caatinga woodland. Visited on 6 July 2002.

Fazenda Nova União (14°25'S, 44°26'W), Montalvânia municipality: 1.5 km north of Montalvânia, the fazenda contains arboreal caatinga, second-growth caatinga woodland, and pastures. Visited on 6 and 7 December 2002.

The general region presents a mosaic of habitats, ranging from open pastures and agricultural fields, to *cerrado*, *cerradão*, areas with an influence of open (usually degraded) caatinga, arboreal caatinga, 'mata de Jaíba', deciduous and semi-deciduous forests, strips of gallery woodland, and some remaining patches of tall woodland (where 'jatobá' *Hymenaea* sp. abounds). This mix of habitats is a result of the geographical location of this area, at the meeting points of the *cerrado* and caatinga biomes, and several areas represent transitional habitats (Rizzini 1997).

Natural habitats have been greatly modified by human actions, and currently only a few areas of intact woodlands remain, where once rich forests existed (Hartt 1870, Spix & Martius 1981). These forests have been felled mainly to provide open land for agriculture, *Eucalyptus* plantations, and to produce carbon, an activity noted at Fazendas Jatobá do Cotobelo and Jatobá da Mata. Silva & Oren (1992, 1997) alerted ornithologists to the fragile situation of the remaining deciduous forests growing on calcareous soils, and Kirwan *et al.* (2001) and Raposo *et al.* (2002) added further details concerning habitat modification in the region. We suggest that imminent land-use reform will be required if remaining natural habitats are to be sustainably managed.

We also checked specimens collected in the region housed in two Brazilian collections: the 'Coleção Ornitológica do Departamento de Zoologia da Universidade Federal de Minas Gerais' (DZUFMG) in Belo Horizonte, Minas Gerais; and the 'Museu de História Natural de Taubaté' (MHNT), in Taubaté, São Paulo.

Species accounts

MISSISSIPPI KITE *Ictinia mississippiensis*

Three observed soaring over Fazenda Jatobá da Mata, south of Várzea da Palma, on 10 January 2003 (IR) is about the sixth country record. All individuals had unbarred tails, a diagnostic character to distinguish this species from Plumbeous Kite *I. plumbea*, with which IR is very familiar. First recorded in Brazil, at the Anavilhanas archipelago, Amazonas, in late November 1985 (Stotz *et al.* 1992) with subsequent sight records of migrant flocks in Mato Grosso: 82 over Chapada dos Guimarães on 14 November 1996 (A. Whittaker *in* Mazar Barnett *et al.* 1999), over 200 south of Poconé on 17 October 1997 (H. Buck *in* Mazar Barnett & Kirwan 2000a), c.20 between Poconé and the rio Pixiam on 12 October 1999 and 63 at the Chapada dos Guimarães on 14 October 1999 (P. O'Neill *in* Mazar Barnett & Kirwan 2000b). Wintering range very imprecisely known. The largest numbers are postulated to be in Paraguay, although Hayes (1995) considered it to be rare in most regions of the country, and northern Argentina (del Hoyo *et al.* 1994). Speculated also to winter in adjacent south-east Bolivia and south-west Brazil (Ferguson-Lees & Christie 2001). The present record seems to indicate that, at least in small numbers, the species does, indeed, winter in Brazil.

ORNATE HAWK-EAGLE *Spizaetus ornatus*

Singles observed at Parque Nacional Cavernas do Peruaçu on 30 May and 24 August 2002 (MFV, SDN). On both occasions, they were flying over patches of arboreal caatinga on limestone outcrops, and the latter was tape-recorded. Ornate Hawk-eagle is a threatened species in Minas Gerais (Lins *et al.* 1997) and this is the first state record from within a protected area (Brandt 1998).

WHITE-BROWED GUAN *Penelope jacucaca*

A specimen was taken, by S. F. Guimarães, at Jatobá (15°18'S, 44°10'W), Januária municipality, on 21 August 2000 (MHNT 4561). This becomes the second state locality, after Mocambinho (Kirwan *et al.* 2001), from where a specimen is also available, taken by J. E. Simon and J. M. C. da Silva on 29 July 1998 (DZUFMG 2883).

LEAST NIGHTHAWK *Chordeiles pusillus*

Up to 50 observed over the rio das Velhas, south of Pirapora, on 1 and 21 October 2002 (GMK, MAE, GMF, RS *et al.*), with fewer individuals noted in early-January 2003 at Rio Lavado and west of Lassance. We had not previously recorded the species in this region (Kirwan *et al.* 2001) and Willis & Oniki (1991) did not record it at Januária. We use these observations to draw attention to the fact, overlooked by Cleere & Nurney (1998) and Cleere (1999), that races other than northerly *esmeraldae* also undertake seasonal movements. Holyoak (2001) also provided very little information on such migrations. We have observed this species in several areas of São Paulo, e.g. around Itirapina, and Minas Gerais states, e.g. at the Serra do Cipó, Serra da Canastra and elsewhere, on a distinctly seasonal basis, confirming that nominate *pusillus* also makes regular migratory movements, as mentioned by Sick (1997). The recent discovery that this species breeds in north-eastern Argentina (Krauczuk 1998), and the timing of records there, also indicate migrations.

PLAIN-TAILED NIGHTHAWK *Nyctiprogne vielliardi*

Until recently known only from the type locality in Bahia, near Manga (Lencioni-Neto 1994), but its known range was thereafter extended south to central Minas Gerais, in the proximity of Pirapora (Whitney *et al.* 2003). In previous visits to the region GMK, JMB *et al.* witnessed large concentrations of these nighthawks along the São Francisco and its main tributaries, considering them to be common in areas around Pirapora, Januária and Mocambinho. At the last we noted groups of 150–200 individuals subdivided into smaller flocks (Whitney *et al.* 2003). Remarkably, during our October and November 2002 and January 2003 visits to the same area, it was only with considerable difficulty that we located any *N. vielliardi*, with none at Mocambinho, very few south of Pirapora, on 12 October (GMK *et al.*), and only two individuals 10 km south of Januária, on 13 January (GMK, JMB, IR). Searches for the species at other, apparently suitable areas of the rio São Francisco, e.g. immediately south-west of the town of Pirapora, in February 2002 (GMK, DB, AG, JM) failed to locate any *N. vielliardi*. The reasons for this drastic variation in numbers can only be speculated. Seasonal movements are plausible, but our mid-December 1999 and mid-January 2003 visits differed in timing by as little as three weeks, and it appears unlikely that the species engages in such migrations (seasonal movements in Band-tailed Nighthawk *N. leucopyga* are known from only one small area of Brazil and nowhere else across its broad range; Holyoak 2001). Climatic events are not likely to have played a major role, nor has habitat modification of those areas used by this species been documented in the region, to the extent to which it would have caused such results. Originally described in *Chordeiles*, Whitney *et al.* (2003) provided detailed rationale for considering it within *Nyctiprogne*.

PYGMY NIGHTJAR *Caprimulgus hirundinaceus*
During nocturnal surveys, a female was spotlighted down to distances of just 25 cm, 12 km south of Pirapora, on 1 October 2002 (GMK, RS *et al.*). Its very small size was immediately apparent, and contrasted noticeably with the other caprimulgids present on the same dirt road, Pauraque *Nyctidromus albicollis* and Scissor-tailed Nightjar *Hydropsalis torquata*. It had only restricted white in the primaries and lacked any white in the tail. Little Nightjar *C. parvulus* might be expected at this season in this part of Minas Gerais (Sick 1997, Melo *et al.* 2000), although we have failed to record it at any localities in this region (Kirwan *et al.* 2001), but was eliminated because it possesses a broad hindneck collar, more extensive white throat, more broadly patterned wing-coverts, supercilium effect, and lacks any white in the wing. Given the very dark plumage of the form *C. h. vielliardi*, which may even lead observers to mistake it for Blackish Nightjar *C. nigrescens* (Ribon 2000), we attribute this record to the nominate subspecies, the first locality in Minas Gerais. Three races of this Brazilian endemic are currently recognised: the nominate in the arid north-east from southern Piauí to Bahia and Alagoas, *C. h. cearae* from northern Ceará to extreme northern Bahia and the recently described *C. h. vielliardi* from one locality in Espírito Santo and another in extreme eastern Minas Gerais (Ribon 1995, Cleere & Nurney 1998, Vasconcelos & Lins 1998).

FRILLED COQUETTE *Lophornis magnificus*
A male observed periodically over 30 minutes within a patch of tall woodland on the left bank of the rio São Francisco, 15 km south of Januária, on 10 February 2002 (DB, AG, GMK, JM) and another male in the same area on 15 January 2003 (GMK). Occurs principally in east coastal Brazil, from Alagoas south to Rio Grande do Sul, and west to Goiás and Mato Grosso (Sick 1997, del Hoyo *et al.* 1999), but there appear to be few, if any, previous mentions of the species for Minas Gerais.

SILVERY-CHEEKED ANTSHRIKE *Sakesphorus cristatus*
Only recently discovered to be relatively widespread in the middle reaches of São Francisco Valley in the extreme south-west of its range (Kirwan *et al.* 2001). Four specimens deposited in DZUFMG were taken at Mocambinho between 14 and 18 September 1996 by G. T. Mattos (DZUFMG 2521, DZUFMG 2522, DZUFMG 2523, DZUFMG 2524; two males and two females). Additional sight-record localities are: Japoré, Poço da Vovó region, and Fazenda Nova União, (MFV, SDN), and, extending the species' range further south from Pirapora (Kirwan *et al.* 2001), just west of Várzea da Palma on 10 January 2003 (GMK).

CHOTOY SPINETAIL *Schoeniophylax phryganophilus*
This relatively common and widespread species of light woodland and scrubland of south-central South America has an isolated population (*petersi*) in the middle reaches of the São Francisco valley. Pinto (1978) only mentioned it for Pirapora, in Minas Gerais, and Barra in Bahia. Sick (1997), probably assuming a continuous distribution, considered it to occur in the São Francisco Valley of interior Bahia and Minas Gerais. We have recorded this taxon at a number of localities in the study region, and though they are all broadly within its known range, very little has been published concerning this form's distribution. Specific Minas Gerais localities from the literature, other than Pirapora (Pinto 1978, Kirwan *et al.* 2001) are near Itacarambi (Kirwan *et al.* 2001), and south of Januária (Willis & Oniki 1991). We have also recorded the species *c.*10 km north of Januária, on 14 January 2003, and between Várzea da Palma and Lassance, on 10 January 2003, when a pair was found nest-building, taking material from a disused Common (Rufous-fronted) Thornbird *Phacellodomus rufifrons* nest. This would appear to be the southernmost record for *petersi*. In addition, a female specimen (DZUFMG 2489) was taken by G. T. Mattos at Mocambinho on 23 November 1996, and MFV has collected others on the western slope of the Serra do Espinhaço in recent years. The species is almost certainly frequent in woodland edge, degraded brush and agricultural land throughout north-central and extreme north-east Minas Gerais. The validity of *petersi* is perhaps questionable (e.g. Vaurie 1980, Brammer 2002, MFV pers. obs.), although a thorough analysis, including vocalisations, is still lacking.

RED-SHOULDERED SPINETAIL *Gyalophylax hellmayri*
Observed at Japoré, on 6 July 2002 (SDN), where one vocalised close to the ground in secondary low caatinga. This is only the third published state locality for *G. hellmayri*, which is considered globally Near Threatened (BirdLife International 2000).

GREATER WAGTAIL-TYRANT *Stigmatura budytoides*
The form *S. b. gracilis* appeared to be rather common in scrub on the left bank of the rio São Francisco, 15 km south of Januária, on 10 February 2002 (DB, AG, GMK, JM; tape-recorded) and 13 January 2003 (GMK). The species was first reported for Minas Gerais by Kirwan *et al.* (2001) from Mocambinho, where further observations by DB, AG, JM and ourselves have demonstrated it to be common. The new locality extends its range further south by *c.*70 km. We will comment elsewhere on the taxonomy of this genus.

MINAS GERAIS TYRANNULET *Phylloscartes roquettei*
Raposo *et al.* (2002) presented details of observations from two localities in the rio São Francisco Valley. At one of these, the Córrego dos Ovos, GMK, RS *et al.* subsequently discovered a pair (the subject of comparatively regular observation in recent years) nest-building on 1–2 October 2002. The nest was located *c.*10 m above

ground in a tree flanking the córrego (stream) and situated within 1 m of a termitarium suspended close to the main trunk. The nest was broadly globular in shape, slightly distended top to bottom (as is typical among several genera of tyrannid flycatchers) with a short side entrance tube, and was constructed of fine rootlets, dead twigs, lichens, grassy material and a small number of dead leaves, and without an inner chamber at this stage (visible because the nest was sufficiently 'transparent'). It was attached to a small branch, almost at its extreme tip, and its approximate dimensions were 10 cm in height and 6–7 cm across. The pair was actively collecting nest material, usually very close to or from the ground, when they appeared almost fearless and would perch within very close proximity of the observers (photographed; see Fig. 2). GMK (together with MAE, GMF *et al.*) returned to the area on 21–22 October 2002, by which time the nest had apparently been completed (Fig. 3). Only one individual was seen throughout the 2–3-hour observation period, and the other was presumed to be sitting. A further visit to the area, on 11 January 2003, revealed no sign of the pair, despite use of playback (they are usually exceptionally responsive) or even the nest. These data are the first available concerning this species' breeding biology. Elsewhere in January 2003, JMB, GMK, IR and HS conducted further playback surveys for the species at several apparently suitable localities in the general region, at Fazenda Jatobá da Mata, along the road through the Companhia Florestal, south of Pirapora, along the road to Serra do Boqueirão and near Jequitaí, near Brejo do Amparo, along the São Francisco river south of Januária, and north of Januária, also without success. Subsequently, however, it has been found in the Cavernas do Peruaçu National Park, by Dante Buzzetti (see del Hoyo *et al.* in press). We can only assume that *P. roquet-*

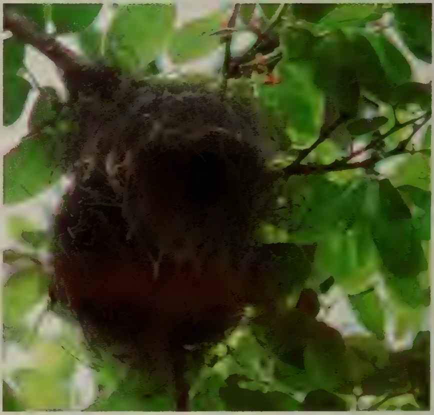

Figure 2. Minas Gerais Tyrannulet *Phylloscartes roquettei*, south of Pirapora, Minas Gerais (Rick Schaefer)

Figure 3. Nest of Minas Gerais Tyrannulet *Phylloscartes roquettei*, south of Pirapora, Minas Gerais (Louise Augustine)

tei is genuinely rather uncommon within its apparently limited range, presumably to large extent due to the ongoing logging of tall emergent trees in this area of Brazil.

STRIPE-NECKED TODY-TYRANT *Hemitriccus striaticollis*

Regularly observed in small numbers 12 km south of Pirapora in degraded gallery forest fringing the rio das Velhas (GMK *et al.*; Kirwan *et al.* 2001). One was observed in second growth of gallery forest at the left margin of the rio São Francisco on 27 April 2002, near Riacho da Cruz village. It vocalised while foraging in the understorey (MFV, SDN). Another was tape-recorded in riverine scrub along the road to Mocambinho, on the right bank of the rio São Francisco, on 12 January 2003 (JMB), and two pairs were tape-recorded in similar habitat, but on the left bank of this river, *c.*15 km south of Januária, on 13 January 2003 (JMB, IR). These individuals moved within the tangled understorey of riverine woodland. This is a little-known species in Minas Gerais and the records south of Pirapora appear to represent the southernmost state locality for the species (see map in Ridgely & Tudor 1994). Although the species was known from this area, its regional distribution is poorly documented, and our records serve to underscore the fact that it is relatively widespread, where suitable habitat exists.

CAATINGA BLACK-TYRANT *Knipolegus franciscanus*

MFV and SDN observed *K. franciscanus* at Parque Nacional Cavernas do Peruaçu, on 30–31 May and 24–25 August 2002, confirming previous observations by Andrade (1990). A single male was observed on both occasions, and was photographed. It perched close to an arboreal caatinga edge near a limestone outcrop. On 14 January 2003, GMK, JMB and IR observed a lone male in low-stature dry forest atop a relatively low rocky outcrop (*lajeiro*) between Riacho da Cruz and Levinópolis, on the left bank of the São Francisco. This was the only individual found between Pirapora and Itacarambi in four days of searching throughout the area. Notably, it was discovered near human habitation. As is usual in our experience of this form, it behaved rather unobtrusively, unlike many others within the genus *Knipolegus*, perching quietly and occasionally very low within the low crowns of the open forest, and only intermittently conducting short, low foraging sallies. Sometimes perched on more exposed situations such as a dead cactus, hanging branches or even on top of rocks. Sally flights were normally within the crown of small trees and also towards the ground. It delivered short, nervous tail flicks. We believe that this species' rather unobtrusive behaviour renders it difficult to find in the taller, more densely vegetated sandstone outcrops that abound in the region. It is therefore probably commoner in the area than our records suggest, although the species clearly has a rather restricted range and specific habitat requirements, and is evidently not common. One exception to this is an area known as Curral de Pedras (17°06'S, 44°35'W), where as many 50 individuals were seen in just one hour, on 22 November 1995 (MAR). Three males and a female were collected and are housed at the Museu Nacional do Rio de Janeiro (MNRJ 42730/31/32/33). Lima (1999) listed only five localities (including Jequitaí) in Minas Gerais for this highly localised and only recently recognised species (Silva & Oren 1992).

LONG-BILLED WREN *Thryothorus longirostris*

One (tape-recorded and photographed) responded weakly and with an unfamiliar vocalisation to playback of the voice of *T. l. bahiae*, at Mocambinho, on 9 February 2002 (DB, AG, GMK, JM) and several of this form were found in caatinga at Parque Nacional Cavernas do Peruaçu, on 30–31 May 2002 (MFV, SDN) and 13 January 2003 (JMB, IR, HS; when tape-recorded). MFV and SDN also found the species on the right bank of the São Francisco, in the Poço da Vovó region, on 7 July 2002. In addition, two specimen records are available for the state, both held at DZUFMG and taken at Mocambinho: DZUFMG 2572 (male) taken on 4 April 1997 by M. R. Bornschein, B. L. Reinert and M. M. Coelho, and DZUFMG 2529 (female) taken on 20 May 1997 by G. T. Mattos. These specimens were compared to the nominate race and appear to belong to *T. l. bahiae*. They also appear to be the first state records, but are unsurprising given the discovery of several other caatinga species from further north in this area of Minas Gerais in recent years. Indeed, MFV and SDN have found this form to be very common in the caatinga of much of northern Minas Gerais, including away from the São Francisco Valley. Specimens have been deposited at DZUFMG. Brewer & MacKay (2002) considered the range of *T. l. bahiae* to encompass Ceará and eastern Piauí south to northern Bahia and Alagoas. We will comment elsewhere on the taxonomy of this species.

SCARLET-THROATED TANAGER *Compsothraupis loricata*

Found at two new localities in January 2003 (GMK, JMB, IR), at Rio Lavado and along the road through the Companhia Florestal, up to 75 km south of Pirapora, which is the southernmost locality for this Brazilian endemic mentioned by Sick (1997). It was also recorded at a number of sites around Pirapora and further north. The species seems relatively abundant in the southernmost edge of its range, and is normally encountered in flocks of 5–15 individuals (possibly involving family groups), mostly in gallery woodlands and taller wooded areas.

GREY-HEADED TANAGER *Eucometis penicillata*

One observed at close quarters in patchy forest bordering the left bank of the rio São Francisco, 10 km south of Januária, on 10 February 2002 (DB, AG, GMK, JM). This widespread species reaches its farthest south and east in Goiás, and western São Paulo and Minas Gerais states (Sick 1997). Our record extends its range to north-central Minas Gerais, a distance of *c.*170 km from one of the closest specific localities that we can locate, Parque Nacional de Brasília (Forrester 1993).

RUSTY-COLLARED SEEDEATER *Sporophila collaris*
Three males were present at the scrubby edges of an extensive marsh beside the road between Jequitaí and the Serra do Boqueirão, on 11 January 2003 (GMK, JMB, IR, HS). They were observed feeding in the open rush-beds fringing the waterbody, and flying back and forth between there and scrubby marsh away from the open waterside. No female-plumaged individuals were found. In the field these birds appeared uniform black from the crown, forehead and cheeks to the lower mantle, with an obvious pale grey rump, the tail and wings were black, with a white speculum, and a white bar on the median wing-coverts. The white throat extended as a half-collar below the cheeks and onto the ear-coverts, but did not meet on the hindneck. There was a broad black pectoral band and otherwise white underparts. Previously, MAR had collected a male probably at the same marsh as the observations above, in 1995 (MNRJ 42726), and a second specimen (MNRJ 28817) from Conceição da Aparecida, south of Belo Horizonte, Minas Gerais, with slightly more ochre suffusion on the belly, was found among the *S. americana* specimens in that institution. These specimens are very different to all other *S. collaris* examined by us in MNRJ but they do recall one, of uncertain locality in Brazil, in the Natural History Museum (Tring, accession number 85.2.10.132). They are, in many respects, closer to *S. americana* than to other *S. collaris* due to the predominantly black-and-white plumage, partial nuchal collar, greyer rump and black pectoral band, although the last was broader than in typical *americana* and unbroken, and there was no trace of a greater covert bar. JMB considered that the bill morphology of these Minas Gerais specimens was strikingly similar to that of specimens of *S. americana* from northern Amazonia housed at MNRJ, and quite different from *S. collaris* specimens in the same institution. Sharing morphological and plumage characters with both *S. americana* and *S. collaris*, we feel unsure as to the taxonomic identity of this population. This also opens questions concerning previous southern records of *S. americana* (e.g. Stuart 2000). Subspecies limits within *S. collaris* are currently under review by MAR, as more than one species may be involved.

SÃO FRANCISCO SPARROW *Arremon franciscanus*
Our observations in the newly declared Parque Nacional Cavernas do Peruaçu indicate this recently described and globally Near-Threatened species (BirdLife International 2000) to be rather common there. We have also discovered it in the Poço da Vovó region, on 7 July 2002 (MFV, SDN) and in scrubby, heavily degraded roadside caatinga just north of Montalvânia, on 8 February 2002 (DB, AG, GMK, JM). An additional specimen (the sixth) to those mentioned by Raposo (1997) is available: a male taken at Mocambinho by G. T. Mattos on 19 May 1997 (DZUFMG 2480). Further south, e.g. around Pirapora, the species appears to be replaced by Saffron-billed Sparrow *A. flavirostris*, which until recently was known from rather few localities in the state (Raposo 1997) principally in the west (e.g. Sick 1997, Silveira 1998, Marini 2001) but also to the centre, around Belo Horizonte (Melo-

Júnior *et al.* 2001, Vasconcelos & Melo-Júnior 2001; GMK pers. obs.), and south (Vasconcelos *et al.* 2002). Thus far, *A. franciscanus* appears to be known from just eight, perhaps nine localities (Raposo 1997, Parrini *et al.* 1999, Kirwan *et al.* 2001, D'Angelo Neto & Vasconcelos unpubl.), though we suspect that it is reasonably common in suitable habitat within its comparatively small range. A record of *A. flavirostris* from Manga (Mattos *et al.* 1991) may well be in error, as *A. franciscanus* was undescribed at that time, and the latter seems much more likely to occur at this site (J. F. Pacheco *in litt.* 2003).

FORBES'S BLACKBIRD *Curaeus forbesi*

It appears worthy of remark that we have searched for this globally threatened species at several localities in the region, without success, notably at the sugarcane fields and marshy areas fringed by woodlands at Brejo do Amparo (JMB, GMK, IR), where probably observed in 1977 by Willis & Oniki (1991) and south of Pirapora, at the rio das Velhas, where found by E. Willis and H. Remold in 1999 (BirdLife International 2000). The habitat at the former is similar to that where the species is known from in Pernambuco (JMB, IR pers. obs, L. A. P. Gonzaga and W. Silva pers. comm.).

Acknowledgements

Among others, the following observers, indicated by their initials in the text, joined GMK and JMB in recent field trips to the middle reaches of the rio São Francisco Valley: Dave Beadle (DB), Mark Elwonger (MAE), Mike Flieg (GMF), Arthur Grosset (AG), Jeremy Minns (JM), Rick Schaefer (RS) and Hadoram Shirihai (HS). GMK is grateful to Robert Prŷs-Jones and Mark Adams at the Natural History Museum (Tring) for access to specimen material at that institution. J. A. Silva kindly prepared the map. Chris Feare, the editor, and Fernando Pacheco, as referee, made several comments which improved the manuscript.

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For details of Club Meetings see inside front cover.

Correspondence and applications for membership, and changes of address should be addressed to: **The Membership Secretary,** Cdr. M.B. Casement, OBE, RN, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA, UK (or **e-mail: mbcasement@aol.com**).

The Membership List 2004 is available, free of charge, on application to the Membership Secretary. This shows addresses (including e-mail addresses, where known), for all paid-up Members as at 31 December 2003. Members are requested to inform him of all corrections or changes, without delay, for dispatch of the *Bulletin*. To offset the cost of postage, any contribution, or a stamped and addressed (A5-sized) envelope will be gratefully accepted.

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Authors are invited to submit papers on topics relating to the broad themes of taxonomy and distribution of birds. Descriptions of new species of birds are especially welcome and will be given priority to ensure rapid publication, subject to successful passage through the normal peer review procedure, and they may be accompanied by colour photographs or paintings. On submission, manuscripts, **double-spaced** and with **wide margins**, should be sent to the Editor, Guy Kirwan, preferably by e-mail, to GMKirwan@aol.com. Alternatively, **two copies** of manuscripts, typed on one side of the paper, may be submitted to the Editor, 74 Waddington Street, Norwich NR2 4JS, UK. Where appropriate half-tone photographs may be included and, where essential to illustrate important points, the Editor will consider the inclusion of colour figures (if possible, authors should obtain funding to support the inclusion of such colour illustrations).

As far as possible, review, return of manuscripts for revision and subsequent stages of the publication process will be undertaken electronically.

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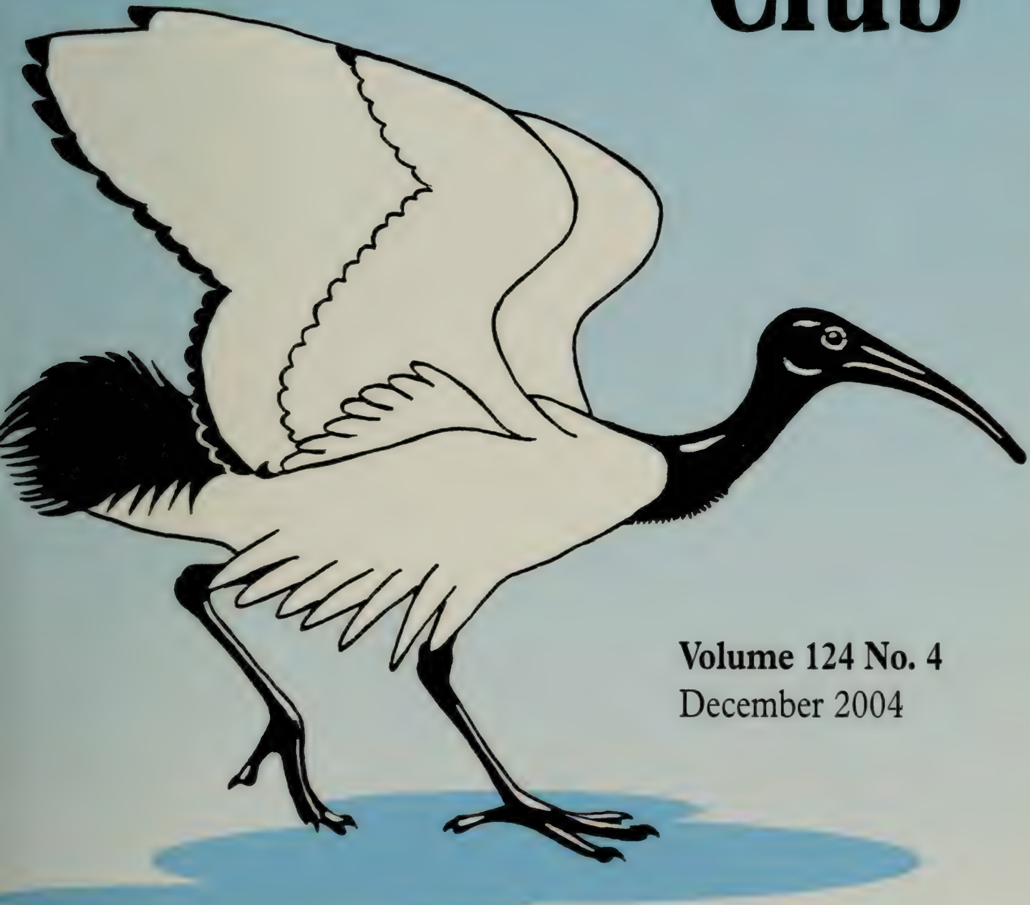

Volume 124 No. 4
December 2004

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. [Limited car parking facilities can be reserved (at a special reduced charge of **£5.00**), on prior application to the Hon. Secretary].

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm.** (A vegetarian menu can be arranged if ordered at the time of booking). Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges are **£19.00** per person but will be increased to **£20.00** as from **1 January 2005.**

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

7 December 2004—Dr A.G. (Andy) Gosler—*Eggshell maculation in the Great Tit and other passerines*
Andy Gosler has worked at the Edward Grey Institute, Oxford, since late 1981 when, having recently completed an MSc in plant taxonomy, he assumed a part-time field assistant's position ringing Great Tits in Wytham Woods. The BOU's David Lack Studentship then funded his D.Phil. to study the evolution and ecology of Great Tit bills in Wytham Woods. Several important studies developed from that work. However, fascinated by the seemingly pointless patterns of pigment spots (maculation) on Great Tit eggs, in 1988 he started recording and comparing the pigment patterns on eggs produced by different females. This ongoing study is yielding fascinating insights into how finely tuned are the breeding adaptations of these. Andy has been a member of both the BOU and BOC since 1976, and since 1998 has edited *Ibis*.

*Applications to Hon. Secretary (address below) by **14 November** please.*

25 January 2005—Professor Glen Chilton—*Lessons learned from the songs of North American sparrows and warblers*
Glen Chilton is an Associate Professor of Biology at St Mary's College in Calgary, Canada. For the past 18 years most of his research efforts have concerned the songs of birds, particularly the evolution of songs in crowned sparrows and New World warblers. This work has taken him to some of the most remote areas of North America. Glen addressed the Club in September 2004 concerning the Labrador Duck and we are delighted to welcome him back to talk about his specialist subject.

*Applications to Hon. Secretary (address below) by **11 January** please.*

15 March 2005 (please note change of date)—Dr D. H. (David) Thomas—*The shady life of birds*
David Thomas, Senior Lecturer in Zoology at the University of Wales, has specialised in the behavioural and physiological adaptations of birds in extreme environments, especially deserts—research on sandgrouse and phasianids in Moroccan Sahara, Negev, Namib and Sonoran Deserts as well as marine habitats—research on penguins in southern Africa and on shearwaters in the UK.

*Applications to Hon. Secretary (address below) by **1 March** please.*

Future meetings in 2005—dates for further meetings in 2005 have been set for the following Tuesdays: 26 April (AGM), 7 June, 27 September, 1 November and 6 December. **Speakers to be announced.**

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2005, giving as much advance notice as possible—please contact: Tony Statham, Woodcock Hill, Durrants Lane, Berkhamsted, Herts. HP4 3TR, UK (or e-mail: SAHS@tinyonline.co.uk).

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Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 124 No. 4 Published 5 December 2004

CLUB ANNOUNCEMENTS

The Club regrets to announce the resignation (with immediate effect) of Mary Muller from her position as Vice-Chairman and as a member of the Committee. Cdr. Michael Casement will assume the responsibility of Vice-Chairman until the AGM in April 2005, as well as continuing his ex-officio role as Membership Secretary.

2005 Subscription renewals—we are grateful to all members who have taken early action on the renewal notice enclosed with the September issue and have increased their Bankers Standing Orders (BSOs) for the new annual rates with effect from 1 January 2005. At the time of going to press (late October), approximately half have notified the Membership Secretary that amended BSOs have been dispatched to their banks and a fair number of remittances have now been received. If action is not already in hand, please do so now in order to minimise delays and unnecessary correspondence over the Christmas period. All queries to the Membership Secretary as soon as possible please (mbcasement@aol.com).

The 925th meeting of the Club was held on Tuesday 28 September 2004, in the Sherfield Building Annexe, Imperial College, London. 23 Members and 8 guests were present.

Members attending were: Dr C. F. MANN (*Chairman*), Miss H. BAKER, Mrs D. M. BRADLEY, D. R. CALDER, Cdr. M. B. CASEMENT RN, Prof. R. A. CHEKE, Prof. G. CHILTON *(Speaker)*, F. M. GAUNTLETT, D. GRIFFIN, C. A. R. HELM, J. P. HUME, D. J. MONTIER, MRS A. M. MOORE, Dr R. P. PRŶS-JONES, R. J. PRYTHERCH, N. J. REDMAN, Dr P. G. W. SALAMAN, S. A. H. STATHAM, C. W. R. STOREY, Dr D. H. THOMAS, M. P. WALTERS, R. P. WEBSTER and P. J. WILKINSON.

Guests present were: M. J. BRADLEY, Mrs C. R. CASEMENT, Dr L. CHILTON, Mrs K. CHILTON, Mrs M. H. GAUNTLETT, Mrs M. MONTIER, P. J. MOORE and D. RUSSELL.

After dinner, Prof. Glen Chilton outlined the unusual stories surrounding the now extinct Labrador Duck in an entertaining talk titled *The curse of the Labrador Duck.* The following is a brief synopsis.

The North American Labrador Duck *Camptorhynchus labradorius* became extinct in the late-19th century. What we know concerning the natural history of the Labrador Duck is greatly exceeded by our ignorance, and the published literature contains many errors. It was a seaduck, and fed on small mussels, from sandy shoals. The species wintered along the American eastern seaboard, particularly in the waters around New York city. The only description of Labrador Duck nests comes from Audubon, who visited Labrador in July 1833; the account accompanies his painting of the species. However his diary explicitly states that he found no Labrador Duck nests. Museums in Tring and Dresden have eggs thought to be those of Labrador Ducks, as does a private collection. DNA analysis has now been performed on all nine eggs to determine which, if any, were actually produced by Labrador Ducks. There are 53 stuffed specimens of Labrador Duck housed in 30 museums in 12 countries. One, in Germany, was destroyed by WWII bombing; many other specimens in England, France and Germany narrowly avoided destruction at that time. One specimen is a reconstruction, using the bill of a Labrador Duck and the body of a white duck with black paint. Most specimens entered institutions before the era of detailed record keeping. Details of collection of some specimens are well documented, providing information about habitats used and the timing of migration. It is unclear why this duck became extinct. As a seaduck, it may have been negatively influenced by raw sewage dumped into the ocean along the American eastern seaboard.

Referees

I am grateful for the invaluable contributions of the following persons, who have provided reviews of manuscripts submitted to the Bulletin during the course of my first year as editor (those who refereed more than one manuscript are denoted by an asterisk in parentheses after their name): Mark Adams, Axel Braünlich, Michael Brooke, Dan Brooks, Bill Bourne, David Christie (*), Mario Cohn-Haft, Nigel Collar (*), Charles Collins, John Cooper, Mike Crosby, Andrés Cuervo, Jon Curson, Richard Dean, Ron Demey, Edward C. Dickinson (*), Bob Dowsett (*), Guy Dutson, Jonathan C. Eames, Brant Fairclough, James Ferguson-Lees, Jon Fjeldså, Steven Gregory, Kees Hazevoet, David Holyoak, Niels Krabbe, Scott Lanyon, Curtis Marantz, Phil McGowan, Fábio Olmos (*), Fernando Pacheco (*), David Pearson, Alan Peterson, Theunis Piersma, Doug Pratt, Pamela Rasmussen, Van Remsen (*), Robin Restall, Craig Robson, Paul Salaman, Frank Steinheimer, F. Gary Stiles, Lars Svensson, David Wege, André Weller (*), and Andrew Whittaker.—THE EDITOR

New records of birds from the Brazilian state of Roraima

by Marcos Pérsio Dantas Santos

Received 26 July 2003

Roraima is the northernmost state in Brazil, and has a total land area of 225,116 km^2 and a population of *c*.325,000. Of these, 200,000 (61.5%) live in Boa Vista, the state capital (Barbosa *et al.* 1997), emphasising the state's generally very low human population density. The naturalist Johan Natterer was the first person to conduct ornithological investigations in Roraima (in 1831–1832). The majority of his collections were made along the rio Branco, especially around São Joaquim fort (Pelzeln 1871). Subsequently, in 1962 Olivério Pinto conducted an expedition to Roraima, traversing the rio Mucajaí, and presented the first avian catalogue for Roraima, summarising bird collections made in the state (Pinto 1966). In recent decades, ornithological effort has been concentrated around Maracá Ecological

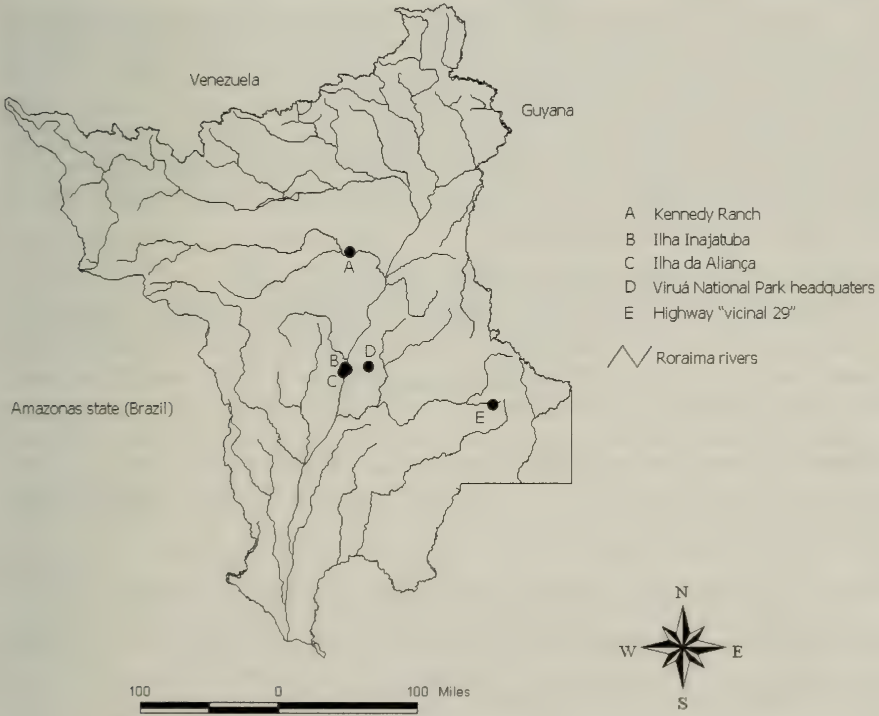
Venezuela
Guyana
Amazonas state (Brazil)
A
B
C
D
E
A Kennedy Ranch
B Ilha Inajatuba
C Ilha da Aliança
D Viruá National Park headquaters
E Highway "vicinal 29"
Roraima rivers
N
W
E
S
100
0
100 Miles

Figure 1. Map showing localities in the state of Roraima mentioned in the text.

Station (Moskovits *et al.* 1985, Silva & Oren 1990) and the capital Boa Vista (Borges 1994). Stotz (1997) compiled the most recent checklist for Roraima, which included a total of 492 species, whilst more recently, Grosset & Minns (2002) published new data on *Poecilurus kollari* and Santos (2003) distributional information for *Cercomacra carbonaria.* I initiated research concerning birds in Roraima in January 2002. During this study I have made six visits to the state, each lasting 2–4 months and surveying seasonally flooded forest bordering the lower rio Branco, regions of higher land forest to the south and savannas to the north, close to the border with Guyana (Fig. 1).

My research has added five bird species new to the Stotz (1997) list and increased the total number of species recorded in the state to 497. All specimens have been deposited in the ornithological collection of the Museu Paraense Emílio Goeldi (MPEG), in Belém, Pará, Brazil.

Species accounts

SAPPHIRE-RUMPED PARROTLET *Touit purpurata*

On 10 August 2002, a male (MPEG 56276) was collected along the road leading to Viruá National Park headquarters (01°29'N, 61°00'W). The species is widespread through the Guianas, northern Brazil, south-west Colombia and eastern Ecuador (Forshaw & Cooper 1973), with the geographically closest records coming from Jaú National Park (Borges *et al.* 2001) and areas north of Manaus (Cohn-Haft *et al.* 1997), both in Amazonas state. However, it had not previously been mentioned for Roraima. In Viruá National Park, it proved to be relatively common, with groups of up to 25 individuals being observed.

CHESTNUT-BELTED GNATEATER *Conopophaga aurita*

On 2 February 2003, a male (MPEG 56879) was collected in the municipal district of São João da Baliza, on highway 29 (00°59'N, 59°52'W), in an area of high-ground forest (*terra firme*). Whilst this species is the most widespread of the genus (Sick 1997), it had not previously been recorded in Roraima.

ZIMMER'S WOODCREEPER *Xiphorhynchus kienerii*

Between 14 and 17 August 2002, five (MPEG 56325–56329) were collected on Ilha da Aliança (01°28'N, 61°15'W), in the rio Branco adjacent to Viruá National Park. This species has been found to occur exclusively in seasonally flooded forest (del Hoyo *et al.* 2003), and is common in such habitat on the Anavilhanas archipelago in the rio Negro (A. Whittaker pers. obs.) and at the mouth of the rio Jaú (Borges *et al.* 2001). Given that this species exclusively occupies flooded forests and that there are no such forests north of Caracaraí (01°50'N, 61°08'W), this region may represent the northernmost limit for the species. For comments on this species' taxonomy see Aleixo & Whitney (2002).

ASH-BREASTED ANTBIRD *Myrmoborus lugubris*
Between 13 and 14 August 2002, four (MPEG 56403–56406) were collected on Ilha da Aliança (01°28'N, 61°15'W), and three additional individuals (MPEG 56401, 56402, 56828) on Ilha de Inajatuba (01°25'N, 61°16'W), in the lower rio Branco adjacent to Viruá National Park. The species occupies flooded forests along the río Napo in Ecuador, north-east Peru, south-east Colombia, in Brazil, along the rio Amazonas to the confluence with the lower rio Tocantins. Its presence in Roraima considerably expands the species' known range from the closest-known localities of the archipelagos of Mariuá and Anavilhanas, on the rio Negro (A. Whittaker pers. comm.).

BLACKISH-GREY ANTSHRIKE *Thamnophilus nigrocinereus*
Between 13 and 15 August 2002, five (MPEG 56351–56825) were collected on Ilha da Aliança (01°28'N, 61°15'W) and it is common on seasonally flooded islands in the lower rio Branco. The species is typically found in Brazil along the rios Negro and Amazon in areas of flooded forest (*várzea*), in forests along small streams and in *igapó* (black-water) flooded forests (Sick 1997).

BLACK-CHESTED TYRANT *Taenotriccus andrei*
On 24 January 2003 one (MPEG 56881) was collected at Fazenda Kenedy (02°40'N, 61°12'W), along the right bank of the rio Mucajaí. Only one bird was found, in a narrow band of degraded forest adjacent to pasture. Traylor (1979) already indicated the species' presence in the state, based on specimens taken along the rio Padauiri, but as noted by Paynter & Traylor (1991) this locality belongs to the state of Amazonas, making my record the first for the species in Roraima. This species is very poorly known and is only sparsely distributed in the Brazilian Amazon (where it is principally known from the Tapajós, Itaituba, Altamira and lower Xingu rivers, the forests around Belém and in northern Maranhão), as well as in southern Venezuela and probably Surinam (Ridgely & Tudor 1994).

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A record of Pale-legged Hornero *Furnarius leucopus* from Ecuador

by Niels Krabbe

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On 2 February 2002, during field work on the eastern slope of the Cordillera de Cutucú in Morona-Santiago Province, south-east Ecuador, along a small tributary of the río Morona, near Unnsuantz (02°33'S, 77°54'W, elevation 525 m), I collected a specimen of Pale-legged Hornero *Furnarius leucopus*. The specimen is now housed in the Museo Ecuatoriano de Ciencias Naturales, Quito (MECN 7647).

There is no published specimen record of the species from Ecuador and north of the río Marañón in Peru, but J. V. Remsen, Louisiana State University, Museum of

Zoology (LSUMZ), kindly placed at my disposal the previously unpublished data of a series of six Peruvian specimens collected during expeditions by LSUMZ in dpto. Amazonas in 1978–1981, all of the widespread form *tricolor*. Two of these were collected along the río Cenepa (near Huampami, 04°28'S, 78°10'W, 200 m), and four along the río Santiago (Caterpiza, 03°50'S, 77°40'W, 200 m), suggesting that the species might also occur in the ornithologically unexplored Ecuadorian territory along these rivers. Field work in seemingly suitable habitat along the río Pastaza (Kapawi, Isla Sharamentsa) in Ecuador, by myself and others, has failed to demonstrate the presence of this easily detectable species, suggesting that its Ecuadorian distribution is genuinely limited to the rivers further west.

Although the Ecuadorian specimen has not been subspecifically allocated through direct comparison, it is undoubtedly referable to *tricolor* like the Peruvian specimens taken nearby.

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A Syrian record: the case of Aharoni's Thick-billed Larks *Ramphocoris clotbey*

by Guy M. Kirwan

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Thick-billed Lark *Ramphocoris clotbey* is the sole representative of an attractive genus restricted to the Western Palearctic, where it breeds discontinuously, sparsely and, in some areas, erratically, from Morocco across North Africa to Jordan, north-central Saudi Arabia and, more irregularly, Kuwait (Snow & Perrins 1998). It was also mentioned for the 'Syrian desert' by Vaurie (1959) where, as detailed by Kumerloeve (1969a), two pairs were found in 1930 and, in 1931, a pair with four eggs. This information was repeated by Cramp (1988), but subsequently Baumgart (1995) considered that the records could not certainly be stated to have been made in modern-day Syria, and regarded the species' occurrence in the latter country as unproven. Snow & Perrins (1998) added similar clarification; it might also be remarked that as early as 1970 Hüe & Etchécopar had questioned whether these records might definitely be considered as being from the Syrian Arab Republic.

Given the species' somewhat nomadic tendencies, it is perhaps surprising that Thick-billed Lark has apparently wandered so infrequently beyond its main range: there are several records from the Eastern Province of Saudi Arabia (Bundy *et al.* 1989), a single mention for the former South Yemen (Hollom *et al.* 1988), at an unknown location on 11 March 1962 (Warr unpubl. ms.), which was not included by Martins *et al.* (1996), an accepted record, in April 1999, in Oman (Eriksen &

Sargeant 2000) and a published claim of one in flight in the vicinity of the former Amik Gölü, southern Turkey, in late May 1975 (Anon. 1976), a record which was not admitted to the list of birds reliably recorded in the country (Kirwan *et al.* 1999).

Aharoni and the Syrian Thick-billed Larks

What of the Syrian record? Kumerloeve (1969a) based his text on Aharoni (1931), who provided a detailed account of the discovery of the nest. However, neither proffered locality information. Prof. Aharoni was a Jewish zoologist of Lithuanian origin, who settled in Palestine and travelled extensively in the latter country and neighbouring regions until his death in 1946 (Warr 1996). His published contributions included the most thorough account of the African Darter *Anhinga rufa* colony at Amik Gölü (the former Sea of Antioch), now sadly lost, considerable information concerning Bald Ibis *Geronticus eremita* breeding places in Syria and many of our initial data for the breeding birds of the Syrian Desert (Aharoni 1928, 1929, 1930, 1931). Unfortunately, his reports were not always reliable or precise. As noted by Kumerloeve (1969b) and Baumgart (1995), there can be almost no doubt that Aharoni's (1932) claim that the Cyprus Wheatear *Oenanthe cypriaca* had bred in Syria is false, whilst Safriel (1980) ably elucidated the problems associated with divining the whereabouts of Aharoni's localities of Bald Ibis colonies in the same country, and Serra (2003) even suggested that over-reliance on these data had resulted in the latter species being erroneously considered to be extinct there.

Baumgart (1995) did not present details as to why he considered the records as uncertainly appertaining to modern-day Syria, nor did he speculate as to which country the records might refer. With the post-World War One division of the Ottoman Empire and our knowledge of Aharoni's wanderings, his records of Thick-billed Lark could pertain to Lebanon, Syria or Turkey.

National boundary changes

Under the terms of the May 1916 Sykes–Picot agreement, Britain and France established an advance agreement to divide the Levant between them upon the cessation of hostilities, with Britain assuming control of modern-day Iraq, Israel and Jordan, and Lebanon and Syria (collectively Greater Syria) being administered by the French. Problems soon arose, however, particularly in the French mandate, which also included the province of Alexandretta (the modern-day Hatay or Antakya province of southernmost Turkey). A special administrative system was designed for the latter under the Franco–Turkish agreement of Ankara, in 1921, and expanded boundaries for Lebanon were declared in September 1920. Indeed, even under the Ottomans, the region around Mount Lebanon had enjoyed a state of semi-autonomy since 1861. In 1926, as part of ongoing constitutional and governmental changes to Greater Syria, the French instituted Lebanon as an independent republic, although it remained under their control. During the period between 1920 and official independence the country's northern border was further north than its current position, encompassing the coastal strip as far as Latakia. In 1939, Alexandretta was finally ceded to Turkey, but despite strong Arab opposition to the French mandate, an independent Syria was not recognised until 1941 and this was not made official until 1946, whilst Lebanon only achieved such status three years earlier, in 1943 (Gilbert 1995, O'Brien 2002, Goldschmidt 2002, Keay 2003).

The specimens

Aharoni (1931a,b) mentioned that his specimens had been sent to England, to Jourdain and Rothschild, and indeed, by chance, I located the two (one labelled a female and the other almost certainly a male, on the basis of size, much whiter-looking bill and more clearly demarcated cheek-spots, and the intensity and size of the black markings on the breast; see Keith *et al*. 1992, Svensson *et al*. 1999) in the Natural History Museum, Tring (accession numbers 1939.12.9.276 and 277; Fig. 1), and the label information confirms that they were taken at 'El Zerka, in the north Syrian desert, on 6 April 1931'. Furthermore, the egg collection at the same institution contains two eggs collected by Aharoni at a locality named Dschukeil,

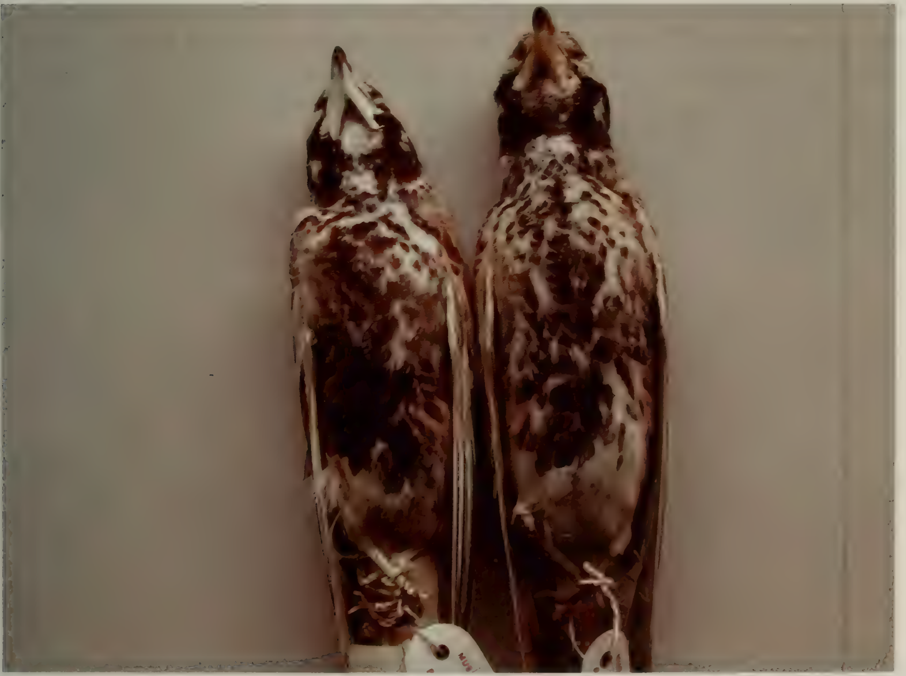

Figure 1. Syrian specimens of Thick-billed Lark *Ramphocoris clotbey* held in the Natural History Museum, Tring (Guy M. Kirwan, copyright the Natural History Museum)

on 20 April 1931. Whether Aharoni found two nests is unclear, given the discrepancy in date and location and the information presented by Kumerloeve (1969a). The two-clutch hypothesis might appear more plausible, given the difference in dates and localities, and that Kumerloeve explicitly stated that 'the' nest had four eggs. However, a perusal of the specimen registers at Tring reveals that Aharoni was collecting at Baalbek and other sites in the Anti-Lebanon range on 20 April and the days immediately prior to and after this date, thus suggesting that an error was made in the registration or subsequently (see Knox & Walters 1992). Baumgart was apparently unaware of the existence of the specimens and eggs (M. Kasparek *in litt.* June 2003).

Identifying the localities

We now come to the issue of identifying the whereabouts of these localities. It is as well to bear in mind the various problems inherent to such research, which were discussed by Safriel (1980). However, from my readings of Aharoni's published field work, it is equally important to note that he was not an uncritical or careless observer, despite some of the errors and problems outlined previously. In his writings, he consistently differentiated between Lebanon and Syria, rather than writing as if he were referring simply to Greater Syria. Thus, from the specimens register at Tring it is usually possible to identify in which of the modern-day countries Aharoni was collecting during a given period.

Given Aharoni's field work in the Hatay, it is possible that the records could have been made on Turkish soil. Neither El Zerka nor Dschukeil, even allowing for variant phonetics, is a Turkish name and both are absent from the most comprehensive gazetteer I have located (Burgett *et al.* 1984). Furthermore, I am unaware of any suitable habitat for the species in this region of Turkey (another factor mitigating against the claim mentioned earlier in this note).

At the time Aharoni made his observations, Lebanon comprised a slightly greater area than it does now. Irrespective of the obvious conclusion should Aharoni's *R. clotbey* have emanated from the part 'returned' to Syria (Latakia), this possibility seems rather unlikely, given the habitat in the relevant region. As already mentioned, the possibility that Aharoni failed to distinguish between Lebanon and Syria appears somewhat remote. For localities of either name (or tangible variants), I searched the Syrian gazetteer available within an online database (http://www.nima.mil/gns/html/cntry_files.html). I located just two possibilities, both relating to El Zerka: Al Zirbeh (a town just south of Aleppo, now Halab, and relatively close to the Turkish border) and Al Zarqa (just north of Al Raqqa and much further east). Of these, the former would appear more probable, it being much closer to Aharoni's known haunts and is in a region with suitable habitat for *R. clotbey*.

However, my perusal of the Tring specimens register revealed that he also collected a juvenile Houbara Bustard *Chlamydotis undulata* (NHM 1939.12.9.242) and a Red-rumped Wheatear *Oenanthe moesta* (NHM 1939.12.9.219), among other species, at El Zerka. The latter is unknown in Lebanon, and the former has been recorded just twice (Ramadan-Jaradi & Ramadan-Jaradi 1999). Even more importantly, the register also reveals that Aharoni was collecting in the well-known Qaryatein area one day prior to a March 1931 visit to El Zerka. This would definitely seem to place the Thick-billed Lark records within modern Syrian territory and prove that Roselaar (1995) was correct to consider the records to have probably come from the Qaryatein–Palmyra area, but also means that neither of the localities identified during the gazetteer search is likely to represent the collecting site of Aharoni's specimens.

Nonetheless, I enquired of Dr G. Ramadan-Jaradi (a Lebanese ornithologist) whether he knew of any localities similar to the names on Aharoni's specimen labels. We eliminated two possibilities due to their location, but another merits full quotation of GR-J's response of June 2003:

> "We also have…Ain El Zarka (34°21'N 36°22'E)…one of the springs which feeds Al Assi (Oronte) River. It is located on the western slopes of the Anti-Lebanon range, north of the Beqaa Valley, near Hermel. It is a semi-desert habitat where rainfall—partially inhibited by the high mountains—is just 250 mm pa. It is a direct extension of the Syrian Desert via the Homs depression. Among the typical plants are *Artemisia*, *Haloxylon*, *Salsola*, *Achillea*, *Scorzonera* and *Gymnarrhenea*."

It is worth noting that the Thick-billed Lark is not mentioned for Lebanon (Ramadan-Jaradi & Ramadan-Jaradi 1999), but that semi-desert areas around Hermel have produced a number of 'surprises' in recent years including Mourning Wheatear *Oenanthe lugens*, Scrub Warbler *Scotocerca inquieta* (Bara 2002) and Temminck's Horned *Eremophila bilopha* and Bar-tailed Desert Larks *Ammomanes cinctura* (Bradshaw & Kirwan 2000), some or all of which may be breeding there. On the basis of the above, *R. clotbey* is clearly worth searching for too. Whilst I consider that the available evidence suggests that Aharoni really did collect his specimens in modern-day Syria, the possibility that it might also occur in present-day Lebanon needs also to be considered.

Acknowledgements

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The nest, eggs and chicks of the White-winged Flufftail *Sarothrura ayresi*

by Barry Taylor, Mengistu Wondafrash & Yirmed Demeke

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The genus *Sarothrura* (flufftails) is endemic to Africa and Madagascar and includes nine species of small rails (length 13.5–17 cm) which inhabit dense ground vegetation of wetlands, grasslands, forest and dense bush (Taylor & van Perlo 1998). Most species are extremely shy and difficult to observe, and are usually located only by their very distinctive calls. Two species are classed as globally Endangered: Slender-billed Flufftail *S. watersi* of Madagascar and White-winged Flufftail *S. ayresi* of mainland Africa (Stattersfield & Capper 2000). The only known populations of White-winged Flufftail occur in highland marshes near Addis Ababa, Ethiopia, and, 4,000 km to the south, in mainly highland marshes of eastern South Africa, where the species is regarded as Critically Endangered (Taylor 2000). Its total numbers are estimated at 210–215 pairs, confined to two marshes in Ethiopia, and 235 individuals in South Africa (Taylor & van Perlo 1998).

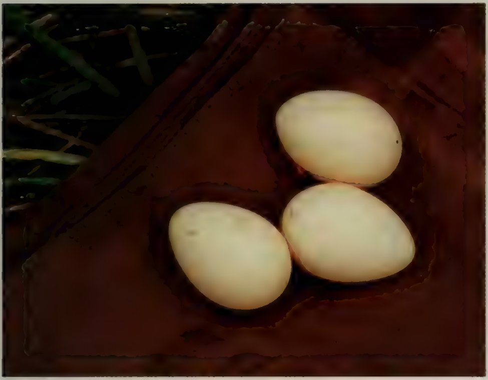
In Ethiopia White-winged Flufftail breeds in July–August, in high-altitude seasonal marshes dominated by grasses, forbs and short sedges (Taylor & van Perlo 1998). The species is recorded from its breeding areas only in June–September, outside which period there is only one country record, from a lower altitude permanent marsh in May (Taylor 1994, Taylor & van Perlo 1998). South African records fall mainly in the period October-March inclusive, with isolated records in May, August and September, whilst there are also records from Zimbabwe in January–March 1977 and 1979, and one from Zambia in November 1962 (Taylor 1994, Taylor & van Perlo 1998). The species is assumed to migrate from Ethiopia to South Africa during the non-breeding season, as there is little overlap in occurrence dates between its two centres of distribution and also because there is no evidence that the species breeds anywhere in southern Africa, where it occurs mainly in tall, permanent reed and sedge marshes, which are very different to its breeding habitat in Ethiopia (Taylor & van Perlo 1998, BT unpubl. obs.).

In Ethiopia, small numbers of this enigmatic species were recorded from 1939 to 1957 (Collar & Stuart 1985), after which no sighting was reported until 1984 (Massoli-Novelli 1988). In August 1995 the species was 'rediscovered' in small numbers at one of its traditional breeding sites (Atkinson *et al.* 1995). From 1996 to 1999, BT made annual visits to Ethiopia to study the species in collaboration with MW, YD and other field workers. This note describes the chicks, which were found in August 1996, and the nest and eggs, which were found in August 1999.

The nest and eggs

The principal problem encountered in studying the breeding of this species is the vulnerability to disturbance and damage of the breeding sites, and the nesting habitat, by observers walking through the vegetation. The birds nest in rapidly growing vegetation only 20–40 cm tall (Taylor & van Perlo 1998), which is very susceptible to damage by trampling. The smaller of the two known breeding sites also suffers significant disturbance and damage by grazing livestock and by the cutting of growing *Eleocharis* sedges—the destruction of almost all of the bird's once-extensive breeding habitat in the highlands near Addis Ababa has been largely due to overgrazing and sedge cutting (Taylor & van Perlo 1998, BT & MW unpubl. obs.). In view of the bird's conservation status, and the importance of the only two known breeding sites for its survival, only very limited searches for nests were made, and great care was taken not to disturb any area more than once and to minimise the amount of damage caused by observers walking through the vegetation. Finding and describing the nest and eggs was, however, deemed essential for two reasons: (1) to establish the precise nature of the nesting habitat, so that suitable areas could be located, protected and restored in currently degraded wetlands; and (2) to clarify the bird's relationships with its congeners—for example, it had been suggested that this species lays patterned eggs (Taylor & van Perlo 1998), whereas all other flufftails lay pure white eggs.

On 12 August 1999 a nest was found by YD and BT at a wetland site near Addis Ababa. The exact location of the site is not given in order to safeguard the wetland from disturbance. The nest was in a clump of mixed vegetation dominated by *Eleocharis marginulata*, a grass (probably *Pennisetum schimperi*) and a buttercup *Ranunculus* sp. It was placed about 1 cm above the substrate, on top of a small pad of *Eleocharis* stems, probably flattened by the bird, that were woven into the nest structure. The ground was largely flat and shallowly flooded to a depth of 1–5 cm and the nest was constructed in a clump of vegetation on a small, low 'island' of moist ground slightly above the water level. The vegetation in which the nest was built was 40–45 cm high and the surrounding vegetation was 30–45 cm high, in a continuous area of similar habitat near the edge of the wetland, about 60 m from the river running along the wetland margin. The nest (Fig. 1) was a ball of woven live *Eleocharis* and grass, with a few growing *Ranunculus* leaves woven into the outside. It was quite thickly lined with long pieces of dead grass and *Eleocharis* woven around the cavity walls. The circular entrance was at the side, near the top and at an angle of *c.*40° above the horizontal. It had *Eleocharis* stems protruding from its base and running down to the ground to form a rough ramp. The entrance faced towards the outside edge of the vegetation clump and the nest was very well concealed by surrounding vegetation, with live *Eleocharis* and *Ranunculus* forming a natural cover over and around it, except in front of the entrance, where there was a small open space just large enough for the bird to stand. There was no tunnel or track through the vegetation to the nest.



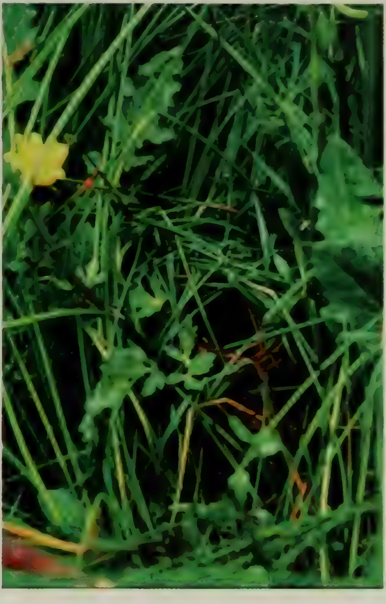


Figure 1. Left: the three eggs from the nest; right: White-winged Flufftail nest, Ethiopia, 12 August 1999 (B. Taylor)

TABLE 1

Morphometrics of three eggs in the nest discovered near Addis Ababa, Ethiopia on 12 August 1999.

Length (mm)	Width (mm)	Mass (g)	Calculated volume (ml)	Calculated density (g/ml)
27.2	19.8	5.47	5.44	1.007
27.3	20.0	5.65	5.57	1.014
27.8	19.9	5.78	5.61	1.030

The female came out of the nest as the observers approached, and walked 1.5 m away to stand on an open patch of flattened *Eleocharis*, from which it flew when the observers were less than 2 m away. A few minutes later a male was flushed *c.*20 m from the nest. Ethiopian Snipe *Gallinago nigripennis* were also nesting in this habitat, and we found over 20 nests of this species while searching for White-winged Flufftail nests.

Nest dimensions (cm) were: outside height 17.5; outside width 15; entrance diameter 4.8; entrance height 5; thickness of walls and base 2.0–2.8; cavity diameter 9.8; cavity height 9.4.

The nest contained three fresh eggs which were oval, white, smooth and slightly glossy (Fig. 1). One egg was collected and is deposited in the National Museum, Addis Ababa. Egg morphometrics are given in Table 1: volumes were computed from volume = $0.51 * L \cdot W^2$ where L = length and W = width (Hoyt 1979).

The nest was visited on 17 and 31 August when it held five incubated eggs, which were slightly visible through the nest walls (D. Kotze *in litt.*). When visited again on 1 September, by YD, the nest was empty with no sign of damage or disturbance, indicating that the chicks had hatched successfully and that the incubation period was 15–16 days, assuming that one egg per day was laid from 13 or 14 August, and that incubation commenced when the clutch was complete.

The chicks

On 24 August 1996, BT visited the smaller breeding site with J. Atkins and S. Millington. While walking through very dense, continuous, 20–25-cm-tall vegetation flooded to a depth of 1–10 cm (most parts had at least 5 cm of standing water) and before dusk, at about 18.00 h, BT found a female White-winged Flufftail running through the vegetation, very unwilling to fly. All the observers stopped immediately and examined the ground, while the female ran around agitatedly. One small black downy chick was found sitting in a footprint on flattened grass. When picked up to ascertain whether it had been injured, the chick called repeatedly with loud, rather harsh cheeps.

A second chick then began to call from another trampled spot, and was also picked up and examined. The female, attracted by the calls, ran around uttering quiet quacking notes and occasional quiet gulps and subdued, repeated *grg* and *crk* notes. A third chick was also found, but sadly it had been stepped on in dense vegetation as the observers approached; this chick was collected and is deposited in the ornithological collection of the National Museum, Addis Ababa. The two uninjured chicks were placed on the ground near the female, who led them into cover. Shortly afterwards a male flew from partially trampled vegetation *c.*30 m from the spot where the chicks had been found. A few minutes before this observation, another chick, possibly from another brood, was heard calling in similar vegetation about 100 m away.

The age of the chicks examined was judged to be two days, from observations of other flufftail species (Taylor 1994). The collected chick weighed 5.4 g and had black down, grey eyelids, blackish-brown eyes and grey-black legs and feet. The bill was shallowly conical with a chisel-like tip to the upper mandible; it had a pinkish-white base, a 1 mm-wide black vertical band immediately in front of the nostril, and an ivory tip. There was no egg tooth. The stomach contained Coleoptera (Dytiscidae) imagines, Diptera larvae (Tipulidae and Tabanidae), and the remains of small crustaceans.

Discussion

White-winged Flufftail is atypical of its genus in several respects: it has white secondaries (a character shared with the small rails of the genus *Coturnicops* of Asia and the Americas); it shows very reduced sexual dimorphism in the plumage; it apparently has a limited vocal repertoire and normally makes advertising calls only for a short period at dawn and dusk; it rarely responds to playback of its calls; and it is often easy to flush (Taylor 1994, Taylor & van Perlo 1998). Also, unlike other flufftails, when breeding it has never been heard to make any advertising or territorial call, or to respond to playback of any of its calls (Taylor & van Perlo 1998, BT unpubl. obs.). Its eggs and chicks are typical of the genus, and it is now clear that this species does not lay patterned eggs, as was suggested by Taylor & van Perlo (1998) on the basis of two unidentified clutches of patterned eggs found in cup-shaped grass nests in a seasonal wetland in Zimbabwe in the 1950s, and thought possibly to be flufftail nests (D. Parkes *in litt.*). White-winged Flufftail's ball-shaped nest differs from those of other wetland and grassland flufftails such as Red-chested *S. rufa*, Streaky-breasted *S. boehmi* and Striped Flufftails *S. affinis*, which build a cup or bowl, sometimes with a loosely woven canopy of live vegetation (Taylor & van Perlo 1998).

Other flufftail species have a nest-building period of 2–3 days, usually lay eggs at daily intervals and incubate the clutch for 14–18 days (Taylor & van Perlo 1998). Assuming that White-winged Flufftail also takes 2–3 days to build its nest, the chicks seen on 24 August 1996 would have been hatched from eggs laid in the first few days of August in a nest constructed at the end of July. Only one week before this, on 24 July 1996, no White-winged Flufftails were seen at the site and the vegetation was deemed too short and sparse for occupation by the birds (J. Atkins *in litt.*), which presumably started nesting almost immediately after their arrival during the last week in July. The nest found on 12 August 1999 would probably have been built at the end of the first week in August; a visit by BT and YD to the site on 4 August showed that the vegetation was only just reaching the height and density to provide adequate cover for the birds, only two of which (both males) were flushed.

The only other record of a young White-winged Flufftail is that of an unfledged juvenile collected at Sululta, Ethiopia on 22 September 1948 (Gadjacs & Keve 1968), and described in detail by Taylor & van Perlo (1998). This specimen is a male, well feathered on the head and body and with growing remiges. Based on the known growth rate of other *Sarothrura* species' chicks (Taylor 1994), this bird is estimated to be about 16 days old, and was thus probably hatched from an egg laid in the third week of August.

Our observations suggest that White-winged Flufftails begin to nest almost immediately after their arrival, which coincides with the development of the vegetation to a height of 20–40 cm and before the ground becomes entirely flooded. This offers some support to the suggestion by Keith *et al.* (1970) that the migratory Streaky-breasted Flufftail may 'represent the White-winged Flufftail ecologically' in central and southern Africa. In this region, Streaky-breasted Flufftails begin nesting almost immediately after their arrival in temporarily inundated vegetation which, although grass-dominated, is often relatively sparse, of a similar height to that used by White-winged Flufftails in Ethiopia, and occurs on moist to shallowly flooded ground (Hopkinson & Masterson 1984, Taylor & van Perlo 1998).

Our observations also suggest that White-winged Flufftails move their chicks to more deeply and continuously flooded areas of denser vegetation very soon after hatching, and such behaviour might provide some degree of protection for the chicks, as the nest sites would be vacated before the vegetation had grown sufficiently to make it suitable for cutting by local people.

The basic information on the breeding habitat, nest and eggs of White-winged Flufftail having been obtained, BT hopes that future work on this species in Ethiopia will give priority to locating new breeding sites and rehabilitating degraded wetlands to recreate suitable breeding habitat. Further disturbance of nesting birds to obtain more information on the nest and eggs would be unjustified, and the best method of obtaining detailed information on the breeding of this species would seem to be captive breeding, which has provided much important information for other wetland flufftails (Wintle 1988, Taylor 1994, Taylor & van Perlo 1998).

Acknowledgements

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Noteworthy ornithological records from Rondônia, Brazil, including a first country record, comments on austral migration, life history, taxonomy and distribution, with relevant data from neighbouring states, and a first record for Bolivia

by Andrew Whittaker

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Located in the south-west of Brazil's immense Amazon region is the state of Rondônia. Rivers play a major role in the state's geography with the rio Madeira dissecting the western section as it flows north-east into the Amazon. Furthermore, the borders with Bolivia are defined by the rios Mamoré, Guaporé and Branco. The state's largest river, the Madeira, acts as a major barrier to many species of birds, animals and plants, which occur on only one side (Haffer 1992). Further east is the rio Tapajós, flowing north-east and forming another major physical barrier to species distribution. The area of land between these two major Amazon tributaries is known as the 'Rondônian area of endemism', and contains many unique bird taxa (Haffer 1974, Cracraft 1985). The Rondônian endemic centre encompasses almost all of Rondônia, with the exception of the extreme west, on the left bank of the rio Madeira, bordering Amazonas and Acre. The presence of this rich endemic centre makes Rondônia of very high conservation importance, due not only to the large number of endemics but also the extremely high indices of deforestation (Fearnside 1987, 1989). Thus the fauna and flora of Rondônia are some of the most threatened within all of Brazilian Amazonia.

Little has been published on the avifauna of Rondônia. Natterer collected along the rios Madeira and Guaporé, whilst von Pelzeln (1868–1871) and Hoffmann concentrated along the lower rio Ji-Paraná and rio Madeira (Hellmayr 1910). More recently, intensive ornithological field work was conducted along the middle rio Ji-Paraná (or 'Machado' as it is known locally), at Cachoeira Nazaré (09°44'S, 61°53'W) and Pedra Branca (10°02'S, 62°06'W) by Stotz *et al.* (1997), resulting in

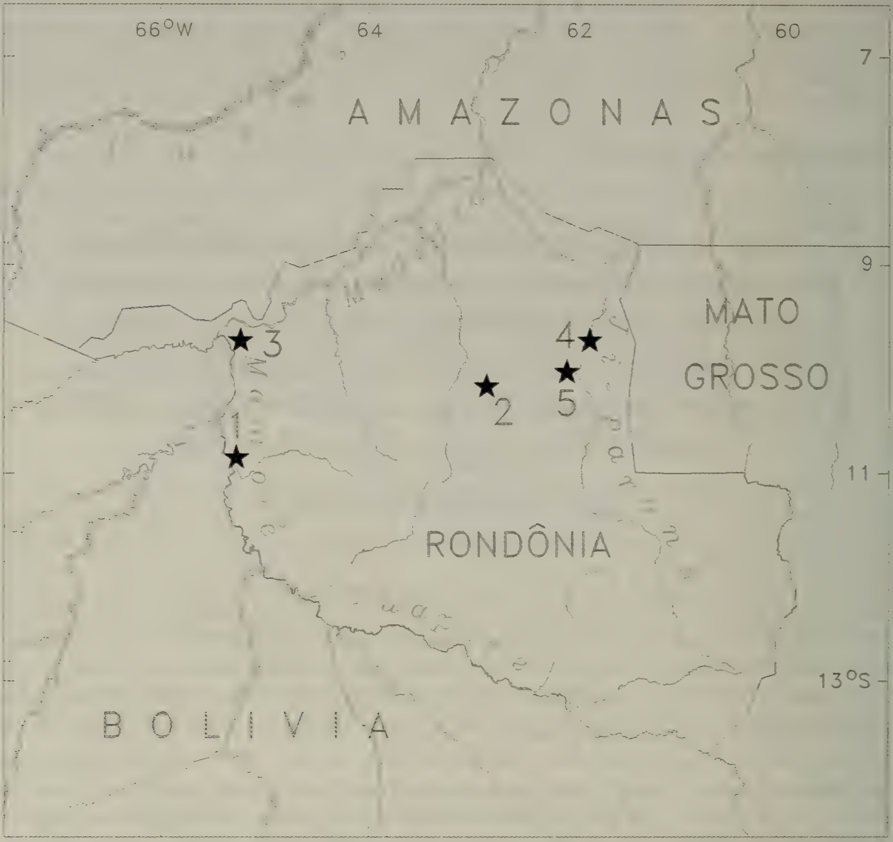

Figure 1. Rondônia illustrating the main survey sites and major collecting sites referred to in the text. State boundaries and major rivers are marked. Stars mark the study sites; 1) Paakas Palafitas Lodge, 2) Fazenda Rancho Grande, 3) Taquaras *campina*, 4) Cachoeira Nazaré, 5) Perda Branca, and 6) Parque Estadual de Guajará-Mirim. Note the scale is too small to depict either Palafitas Island or Nova Colonia.

several noteworthy discoveries, including the remarkable Rondônia Bushbird *Clytoctantes atrogularis*, new to science (Lanyon *et al.* 1990).

Here I present important ornithological records made during field trips to Rondônia, including the first documented Subtropical Doradito *Pseudocolopteryx flaviventris* for Brazil and the first documented Pearly-breasted Conebill *Conirostrum margaritae* for Bolivia. Species accounts include life-history data for several little-known species (with additional non-Rondônian data included where deemed important), comments on austral migrants, taxonomy and distributional information, including range extensions and new state records. References consulted for prior Rondônian records, in addition to those already listed above, were (Peters 1940, 1948, 1951, 1968, 1979a,b, Pinto 1944, 1978, Ridgely & Tudor 1989, 1994, Whittaker 1996a).

Austral migrants are species that breed in southern temperate South America and during the austral winter move north (Sick 1985, 1993, Chesser 1994). In general, such migrants arrive in Amazonia in March–May and depart in September–November. The presence of several austral migrants can be relatively hard to determine in Amazonia due to the existence of local resident populations; on arrival they merely augment existing populations and often go unrecorded. For example, Tropical Kingbird *Tyrannus melancholicus* is resident throughout Amazonia, making it near impossible to determine not only when austral migrant kingbirds arrive but also how many are involved, how long they remain and when they depart south. Often the only clue to the presence of migrants in Amazonia are flocks of 10–20 Tropical Kingbirds perched high in treetops along rivers during the austral winter (pers. obs.).

Methods and study sites

Survey work involved both audio and visual methods, with a significant emphasis on vocal identification. Voucher tape-recordings were made using a Sony TCM 5000 and a Sennheiser ME 66 microphone. All tape-recordings will be archived at the British Library National Sound Archive. Observations were made using 10 x 42 binoculars and by using playback to confirm visual identifications.

Survey work focused on three main sites (Fig 1): five trips were made to Fazenda Rancho Grande, near Ariquemes, in 1989–1995; an eight-day rapid ornithological assessment of the Parque Estadual Guajará-Mirim was conducted in April 1995; and two visits to Pakaas Palafitas Lodge and the surrounding area were made, on 3–12 July 2002 and 18–26 June 2003. I also include opportunistic observations made en route from Porto Velho to Guajará-Mirim at Taquaras and along the rio Guaporé south of Pimenteiras do Oeste. Details of the survey sites and their vegetation are listed below.

Fazenda Rancho Grande near Ariquemes (10°17'S, 62°52'W): primary upland *terra firme* forest, pastures and second-growth forest and some river-edge habitats. Continued deforestation in neighbouring fazendas has reduced the size of this forest and it has become more isolated from virgin forest.

Parque Estadual de Guajará-Mirim (10°50'S, 64°85'W): surveys were made along a recently cut road running east to the rio Formoso. Habitat consisted of primary upland *terra firme* with some river-edge, and microhabitats of *Guadua* bamboo and extensive dense vine tangles. Some small hills and bluffs occur in the *terra firme*, with rocky outcrops of 100–200 m supporting drier, stunted semi-deciduous forest. What appeared to be recent illegal entry had prompted road cutting, timber extraction and hunting within the park's boundaries.

Paakas-Palafitas Lodge (10°51'S, 65°16'W): situated 10 km south-east of Guajará-Mirim at the confluence of the rio Mamoré (white water) and the rio Pacaás Novos (black water). Based at the lodge, surveys were made in nearby upland *terra firme*, *várzea* and *igapó*, oxbow lakes, river bluffs, second-growth forest and cattle pasture. Much timber extraction and subsistence farming was evident (increasing in 2003) in nearby upland *terra firme*. However, large forest tracts are still connected to contiguous virgin forest.

Palafitas Island (09°74'S, 65°13'W): situated 5 km upriver of Paakas Palafitas Lodge on the rio Mamoré, an unnamed river island, which for my purposes here I refer to as Palafitas Island. Habitats included sandbars (at low water), mudbanks and successional riparian habitats dominated by various pioneer plant communities and mature disturbed *várzea*. The island is uninhabited: although a small area of *Cecropia* and cane grass found burnt in 2002, the same area was undisturbed in 2003.

Nova Colonia (09°01'S, 65°80'W): a small settlement *c.*12–15 km along the rio Pacaás Novos with three families along a small left bank (black-water) tributary. Here I surveyed *igapó* and primary upland *terra firme* and second-growth forests.

Taquaras campina (09°44'S, 65°13'W): near the small town of Taquaras. Here I surveyed *campina* forest (white-sand forest on a poorly drained sandy/clay soil) with stunted trees.

Habitats

Here I present a brief description of the various habitats and microhabitats that I surveyed and that are mentioned in the species accounts. Vegetation classification is based on Stotz *et al.* (1996), where more detailed floristic species lists typical of each habitat can be found.

Forested habitats

Tropical Lowland Evergreen Forests. Forests below 900 m, where rainfall is greater than 2,000 mm pa, grow where soils are suitable, sufficiently deep, well drained and never flooded.

Upland *terra firme* forest has canopy heights of 30–40 m with emergents reaching 50–60 m and a closed canopy. The understorey was rather open and contained many spiny palms. *Terra firme* is renowned for the extraordinary diversity of plant species (Gentry 1990). Microhabitats found within these forests included *Guadua* bamboo, treefall gaps, vine tangles and stream sides. This forest type is the most abundant habitat and therefore the most commonly surveyed.

Flooded Tropical Evergreen Forests. Flooded permanently or annually, most such forests are structurally and floristically similar to upland forests, but differ in supporting flood-tolerant trees and undergrowth plants. For more detailed information see Prance (1979).

Floodplain *várzea* is found only along Amazonian white-water rivers and is flooded annually for several months. This habitat is sparse, being found only on Palafitas Island, where the canopy is 20–30 m with a typically open understorey and dense *Heliconia* patches, vine tangles and many bromeliads, with some human disturbance.

Floodplain *igapó* forest is primarily found on sandy soils bordering black-water and clear-water rivers of Amazonia. Typically flooded for 5–6 months or longer p.a., this forest type occurs along the rio Pacaás Novos and its tributaries. At Novo Colonia it varied greatly, from tall forest with a 20–30 m-high canopy to a denser, lower 6–10 m-high canopy nearer the river. Both types have a very open understorey with few or no shrubs. Denser vine tangles were found along smaller streams and several areas of standing water.

Filled-in floodplain lakes (swamp forests), in my survey refers to an oxbow lake containing several mature stands of *Ficus* and large clumps of *Cecropia*, and small-leafed bamboos at the edge of standing water. Around the lake are low stunted bushes, clumps of small trees, 5–10 m tall, and many flooded sedges.

River-edge (and river island) forests. River-edge are early successional forests bordering rivers, and sometimes referred to as river bluffs. They replace riparian shrubby thickets and, in upper Amazonia, are regularly flooded, although run-off is rapid and vegetation is rarely submerged for more than a few days or weeks. This habitat contains stands of trees dominated by *Cecropia*, some *Ficus* and much *Gynerium* (Gramineae).

River islands are dynamic, constantly changing size and shape. Thus, a variety of successional habitats can be found, depending on the age of the island (Remsen & Parker 1983). I surveyed a mature island, with vegetation types from cane grass, *Tessaria*, *Mimosa* and *Salix* scrub, clumps of *Cecropia* and 20–30 m-tall mature *várzea* with some vine tangles.

Gallery forests. These occur along watercourses throughout drier regions (annual rainfall less than 1,600 mm), where other conditions (e.g. fire) inhibit the growth of woody vegetation away from the rivers.

White-sand forests. Forest and scrub on white sand in Amazonia. These occur very patchily, covering *c*.60,000 km in Brazil (Pires 1974). Overall structure and composition varies greatly between sites, depending on soil type and drainage. Typically, most white-sand soils in Brazil contain virtually no clay; nutrient levels are extremely low and water retention poor. However, in my study area white-sand forests occur on weathered clays with poor drainage (pers. obs.). Edaphic conditions, especially drainage, considerably affect vegetation structure and composition (Gentry 1988). Plant endemism is high in these *campinas*, but plant diversity is low (Anderson 1981). Such white-sand forests are referred to as *varillal* or very low-stature *chamizal* in Peru (Alvarez Alonso & Whitney 2003).

Campina is rather open scrub, with only small shrubs and trees (4–12 m), and patches of bare sand, which are usually well drained. I surveyed poorly drained *campina* on white-sand weathered clay at Taquaras *campina*, which has a 10–12 m canopy and adjacent taller *campinarana*. Low tree species diversity occurs in both areas. The *campina* has melastomes dominating the fairly open understorey, where small patches of low terrestrial bromeliads most frequently occur in the lower wetter areas.

Campinarana is closed-canopy woodland taller than *campina*, which often occurs adjacent to *campina* where soils with more nutrients and better drainage exist. This, in turn, is surrounded by upland *terra firme*, where soils are richer still, with the transition being gradual (pers. obs.). The Taquaras site has a closed canopy of 12–18 m with an open understorey and few or no shrubs.

Palm forests. Small to extensive stands of *Mauritia flexuosa* in poorly drained areas within savannas, at lake edges or along streams in Amazonia.

Second-growth forests and woodlands. Two types were surveyed: tall second growth dominated by *Cecropia* and lower shrubby vegetation dominated by *Vismia* spp. The latter is sometimes described as second-growth scrub.

Non-forest habitats

Cerrado is distinctive savanna vegetation, with tall grass and scattered low, gnarled trees. In areas of denser tree cover it is known as *cerradão*. This habitat occurs mostly in central Brazil, adjacent eastern Bolivia and north-east Paraguay.

Species accounts

AGAMI HERON *Agamia agami*

S. L. Hilty and I observed an adult and an immature at an overgrown oxbow lake at Paakas Palafitas Lodge. In response to my close approach a low guttural series of notes, presumed to be an alarm call, was repeated and tape-recorded. Zimmer & Hilty (1997) reported what must be the same voice as *uur' r'r'r'* from Amazonas, Venezuela. This unobtrusive species was recorded by Stotz *et al.* (1997) as rare along the middle rio Jiparaná.

LEAST BITTERN *Ixobrychus involucris*

A single vocalising bird was tape-recorded at an overgrown oxbow lake at Paakas Palafitas Lodge by S. L. Hilty and myself on three evenings between 20 and 25 June 2003. This apparently represents a new state record. The Amazonian distribution of the species is poorly understood as it inhabits dense marshes and, unless vocal, is easily overlooked.

ORINOCO GOOSE *Neochen jubata*

At least two territorial pairs were present at Palafitas Island, in the rio Mamoré, during July 2002 and June 2003. Birds were tape-recorded and observed entering forest, where they were presumed to be nesting in July 2002. Reported as rare on the middle rio Jiparaná (Stotz *et al.* 1997). Once widespread in Brazil, Orinoco Goose is now extremely rare and very local, and mostly encountered along remote waterways with low human populations and little or no hunting pressure. In areas such as along the middle rio Juruá flocks of up to 20 were not uncommon in 1991 (Whittaker & Oren 1999).

ZONE-TAILED HAWK *Buteo albonotatus*

An adult observed mid-morning on 11 July 2002 outside Guajará-Mirim, soaring over a small serra 2 km east of the town. This is apparently the first record for Rondônia. There are few records from Amazonian Brazil, the closest being from Acre, at Cruzeiro do Sul, and along the upper rio Juruá at Porto Walter (Whittaker & Oren 1999).

ROADSIDE HAWK *Buteo magnirostris*

Surprisingly, in 2003 two subspecies were observed sympatrically at Paakas Palafitas Lodge, the darker *B. m. saturatus* and paler *B. m. magnirostris*. In plumage the darker *saturatus* was easily identified by its characteristic blackish hood, dark brown upperparts, white eye and cinnamon-rufous barring below, whereas *magnirostris* is distinctly paler above with a grey back and head, yellow eye, grey upper breast and finer tawny barring below. These differences were obvious in the field, where *saturatus* was the commonest form, with 2–4 seen daily. I recorded only one adult *magnirostris*, on 22 June 2003, perched beside the rio Pacaás Novos.

In Brazil *saturatus* occurs in Acre, Mato Grosso do Sul and Mato Grosso (Pinto 1978), with *magnirostris* throughout Amazonian Brazil. However, on 23 and 25 June 2003, I observed two adults intermediate between these two subspecies unidentified to any race or age-related plumage. This observation suggests interbreeding where the two forms are sympatric. Possibly *saturatus* has recently colonised Rondônia from the south, following rapid deforestation in recent decades, permitting the two forms to come into contact. Further research around Guajará-Mirim is essential to clarify if the two subspecies do interbreed.

LONG-WINGED HARRIER *Circus buffoni*

A dark-morph adult was videotaped quartering over early-successional growth at Palafitas Island on 10 July 2002. This appears not only to be a new state record but also the first for Amazonian Brazil, and certainly represented an austral migrant. Austral migrants in Brazil are principally known from Rio Grande do Sul and Santa Catarina (Sick 1985), but the nearest records to Rondônia are from Mato Grosso, in the northern Pantanal, and Chapada dos Guimarães where this harrier is present only during the austral winter (pers. obs.).

CRYPTIC FOREST-FALCON *Micrastur mintoni*

This recently described species (Whittaker 2002) was observed and tape-recorded in *terra firme* near Paakas Palafitas in June 2003 and at Nova Colonia in July 2002. It was also recorded in seasonally flooded *igapó* and in second growth bordering *terra firme* at Novo Colonia. Two specimens, previously identified as Lined Forest-falcon *M. gilvicollis*, from Cachoeira Nazaré (Stotz *et al*. 1997) are, in fact, *mintoni* (pers. obs.). Lined Forest-falcon occurs in Rondônia only west of the rio Madeira, in *terra firme* (Whittaker 2002).

ORANGE-BREASTED FALCON *Falco deiroleucus*

I located an adult (presumed male) of this rare falcon on 15 July 2000, while leading a bird tour with S. L. Hilty, on the rio Guaporé, south of Pimenteiras do Oeste, Rondônia. This is seemingly the first state record, with the nearest known records being from Mato Grosso, where K. J. Zimmer and I observed an adult at Chapada dos Guimarães on 13 September 1996.

For many years, Orange-breasted Falcon was considered absent from central Amazonia (Cade 1982), but recent reports have confirmed that it inhabits central Amazonian Brazil (Whittaker 1996b). The Rondônian record and other unpublished Amazonian records confirm this: K. J. Zimmer and I observed what was presumably the first record for Roraima, a subadult on a river island in the rio Branco, 6 km north of Boa Vista, on 1 November 1994, and also an adult male at the Serra dos Carajás, Pará, in February 2003.

Documented hunting attempts and prey of *F. deiroleucus* are few. S. L. Hilty and I observed the male still-hunting from the crown of a dead 25–30 m emergent on a river bluff of the rio Guaporé. The falcon launched itself from the 25 m-perch in very fast direct flight, initially in a sharp 45°-dive until it reached *c*.10 m above the water, where it adopted powerful horizontal dashing flight for *c*.350–400 m towards a Great Kiskadee *Pitangus sulphuratus*. The flycatcher was flying across the river, but presumably noted the approaching falcon and thus evaded its upward stoop. The falcon thereafter immediately returned to its original perch. This had been assumed to be the most common hunting technique (Bierregaard 1994). Prey are mostly medium-sized to large birds, including pigeons, parrots, parakeets, swifts and martins (Bierregaard 1994), but smaller prey such as insects have been recorded (Whittaker 1996b). I also confirmed an adult female taking a Crested Oropendola *Psarocolius decumanus* from a photograph taken by Jackie Dann, in Bolívar, Venezuela.

LARGE-BILLED TERN *Phaetusa simplex*

I observed this common and widespread species on several occasions following both Tucuxi *Sotalia fluviatilis* and Amazon River Dolphin *Inia geoffrensis* pods along the rio Mamoré at Paakas Palafitas Lodge. Birds were seen plunge-diving near these dolphins and taking fish disturbed by the dolphins or pieces of fish left by them. I have noted this behaviour frequently throughout Amazonian Brazil on all major rivers, where the birds follow dolphins for long periods swooping or plunge-diving for prey disturbed by them. Large-billed Terns seem to more frequently engage in this behaviour when following the larger *Inia geoffrensis*, although further observations are needed to quantify this.

CRIMSON-BELLIED PARAKEET *Pyrrhura perlata*

Regularly observed in small flocks at Fazenda Rancho Grande by K. J. Zimmer and myself. In late-January 1995 six including two apparent immatures were observed food begging (head-bobbing). The immatures mostly differed in lacking the bold crimson belly, instead showing just a few sparse crimson feathers on the belly. Crimson-bellied Parakeet is sympatric with Hellmayr's Parakeet *P. amazonum* (Joseph 2002), a Brazilian endemic, at all three sites but was the less common of the two. Flight calls of these *Pyrrhura* are so similar, and vary according to the number of birds calling, that the less common Crimson-bellied can be overlooked. However, when Crimson-bellied Parakeet vocalises from a perch it is fairly easily separated by voice from Hellmayr's Parakeet, instead sounding most similar to Pearly Parakeet *P. lepida*.

RUFOUS-VENTED GROUND-CUCKOO *Neomorphus geoffroyi*

This rarely seen species was observed on three occasions for a total of *c.*20 minutes in *terra firme* at Parque Estadual de Guajará-Mirim, on 24–25 April 1995. During my observations I noted the following details: mantle glossy green, wings greenish with purplish flight-feathers, tail (in good light) metallic purplish with metallic greenish tips, forehead scaled buff-brown, hindcrown metallic green and hindneck boldly scaled green with less obvious pale buff, heavy buff scaling reaching to the black breast-band, and below plain buff with a rufous ventral area. Soft parts: irides dull creamy white, bill horn and legs grey. Only after three close views was I able to note the bird's bright blue bare post-orbital skin; thus, this field mark could be easily overlooked in shaded forest understorey. My plumage description most closely accords with nominate *geoffroyi*, which is known from specimens taken along the rio Madeira at Calama and Maruins (Peters 1940).

Little has been published on the behaviour of this species. I initially observed it foraging on the forest floor below an understorey mixed-species flock of antshrikes (*Thamnomanes*, *Thamnophilus*), antwrens (*Myrmotherula*) and Rose-breasted Chat *Granatellus pelzelni*. The *Neomorphus* was confiding when I was still, but any movement would cause it to raise and depress its long, glossy metallic green crown feathers. I also observed the bird scratching its large bill with its feet, rather like a domestic chicken. It kept entirely on the forest floor, where it walked slowly and deliberately, and without warning would suddenly run at great speed (quicker than anticipated), before abruptly pausing to catch unidentified prey in the leaf litter. The running bird was extremely fast and agile, even moving thus through dense vine tangles. It also habitually lowered the head from the normal position just before running until it stopped. The ground-cuckoo seemed to prefer the thick cover of fallen vine tangles, which are fairly widespread in parts of this forest. Once I saw the bird crouch on the ground, quivering its wings and opening the bill, perhaps suggesting the presence of a second bird.

The voice of the nominate form, to my knowledge, is unknown. I only twice heard loud bill-clapping when the bird ran directly towards me, to within 3 m. I played the voice of Rufous-winged Ground-cuckoo *N. rufipennis* without eliciting any response.

Further research is urgently required to properly assess species limits and basic ecological requirements among this ground-cuckoo's disjunct taxa. Significant habitat destruction is occurring or has occurred throughout the species' range, particularly where *N. g squamiger* (in the lower rio Tapajós), *N. g. maximiliani* (Bahia) and *N. g. dulcis* (Espírito Santo to Rio de Janeiro) occur. All are Brazilian endemics and warrant immediate research and conservation attention. Documentation of the threatened Banded Ground-cuckoo *N. radiolosus* from Ecuador and Colombia in lowland *terra firme* confirms this species to be extremely sensitive to habitat disturbance (Collar *et al.* 1992).

BURROWING OWL *Speotyto cunicularia*

One was observed along the road from Porto Velho to Fazenda Rancho Grande, on 24 January 1995, and at least two pairs in cattle pasture near Paakas Palafitas Lodge, daily in June 2003. The species is presumably a recent colonist in Rondônia following large-scale deforestation that has transformed vast areas into cattle pasture. I am unaware of any previous records from the state, and my observations appear to the first. Very few records are available for this open-country owl from rainforest areas in the Amazon basin. The closest are both from Amazonas, where deforestation has made way for large-scale cattle ranches, mostly south of the Amazon. However, north of the Amazon, some 80 km north of Manaus, a resident individual was located at one of three large 15,000-ha partially deforested cattle ranches, during 1992 to 1994 (Cohn-Haft *et al.* 1997), and south of the Amazon I recorded a pair 35 km south of Careiro, on 28 September 2003.

SAND-COLOURED NIGHTHAWK *Chordeiles rupestris*

A flock of 50+ was present on recently exposed sand and mudbanks on Palafitas Island, in the rio Mamoré, in both July 2002 and June 2003. Water levels were falling (an annual event at this season), and these usually silent, crepuscular birds were very vocal and active even in mid afternoon, as nest sites on exposed sandbars became available. Displaying males were chasing one another and calling loudly in flight. Displaying birds were easily recognised as males, as on landing they revealed their striking white throats while uttering their rather musical gurgling songs.

NACUNDA NIGHTHAWK *Podager nacunda*

A lone bird was observed day-roosting on a sandbar on Palafitas Island on 10 July 2002. Upon my approach the bird opened its eyes, raised its head and fluffed out its throat, revealing its white throat patch (confirming it to be a male). It then proceeded to give a single deep gruff call, which was repeated every 7–10 seconds before it flushed, landing *c*.30 m distant. The species is a well-known austral migrant to Amazonia (Sick 1985) and I assume this individual too was an austral migrant. Nearest breeding records are from northern Mato Grosso, where I have recorded breeding in September at Chapada dos Guimarães (unpubl. pers. obs.).

SILKY-TAILED NIGHTJAR *Caprimulgus sericocaudatus*

This little-known nightjar was tape-recorded at Parque Estadual Guajará-Mirim on the clear moonlight night of 25th and dawn of 26 April 1995. Four to five well-spaced birds were heard singing in primary upland *terra firme* dotted with a few bare rocky outcrops. This record appears to represent the first for Rondônia.

In response to playback, a bird flew 150–200 m from a forest clearing and landed *c*.8–12 m above me in a tall sapling. This male then started singing from a fairly concealed perch, a rather melodious two-note call, repeated monotonously every 1–2 seconds for periods of up to three minutes. The bird tossed its head slightly upwards when singing. It was noted to be overall dark, but I noted a distinct broad rufous collar and heavy white spotting on the upper breast.

Comparisons with tape-recordings of nominate *sericocaudatus* from Argentina and *mengeli* from Ucayali, Peru (Hardy *et al*. 1989), confirmed the Rondônian birds to pertain to the latter. Subspecies *mengeli* is known from very few Brazilian localities, with Amazonian specimens from Santarém, Pará (Pinto 1978, Sick 1985), and I tape-recorded a singing male at rio Cristalino, Alta Floresta, Mato Grosso, at a clearing in primary upland *terra firme*. This is the sole record during 15 years of intensive field work at the site (pers. obs).

SCISSOR-TAILED NIGHTJAR *Hydropsalis brasiliana*

An adult male was almost overlooked as a Ladder-tailed Nightjar *H. climacocerca* when flushed from a day roost on Palafitas Island on 10 July 2002. The bird was disturbed from low bushes in early-successional growth and flushed *c*.10 m to perch on an exposed horizontal branch 1 m above ground in a young sapling. The species probably undertakes rather local movements or perhaps some are austral migrants, as it is not usually found on Amazonian river islands. Along the rio Mamoré, as in most of Amazonia, *H. climacocerca* is the common riverine nightjar, being often fairly numerous on white-water river islands (pers. obs.). Movements of *H. brasiliana* are poorly known in Brazil, but the race *furcifera* disappears from many areas of Rio Grande do Sul during the austral winter (Belton 1984).

LONG-TAILED POTOO *Nyctibius aethereus*

One heard on 28 January 1995 in *terra firme* at Rancho Grande, Ariquemes. Reported to be a rare resident by Stotz *et al*. (1997) at Cachoeira Nazaré from river-bluff forest. Unless its vocalisations are known and nocturnal surveys undertaken this low-density species easily goes unrecorded.

LESSER SWALLOW-TAILED SWIFT *Panyptila cayennensis*

A pair was observed roosting in a nest positioned under a building beside the rio Mamoré, at Paakas Palafitas Lodge, in late-June 2003. The nest was a *c.*1-m-long vertical, straight tube with a diameter of 10–12 cm and the entrance at the bottom, located 12 m up on the underside of a large cement roof supported by stilts. The nest was constructed of yellow plant fibres neatly cemented together. Nesting in Brazil was recorded by Sick (1985), who reported nests attached to tree trunks and even on a roof inside a house. I observed a nest in Alagoas in January 2004, located in the apex of the eves of a chalet. Sick (1947) also stated that nest length varies from 30 cm to 1 m.

RUFOUS-NECKED PUFFBIRD *Malacoptila rufa*

Only two records of this rarely encountered and poorly known puffbird were made, in *terra firme* understorey at Rancho Grande, in May 1990, by R. S. Ridgely, G. Tudor and myself, and by K. J. Zimmer, on 29 January 1993. Stotz *et al.* (1997) recorded this puffbird as common at both Cachoeira Nazaré and Pedra Branca. However, this included mist-net captures (1,450 mist-netting days). Mist-netting is one of the most reliable methods of censusing these forest puffbirds, enabling a true impression of their abundance (pers. obs.).

Little is known about the behaviour of Rufous-necked Puffbird. Singles or widely spaced pairs still-hunt from perches, normally at 2–10 m, occasionally higher, within forest, and if flushed fly silently in a normally straight line before landing 15–20 m distant. On landing they slightly spread their tail-feathers and nervously jerk the tail sideways (either to left or right) from the normal vertical position. These movements continue until the tail is *c.*15–20° from the vertical, and then return to the latter, before jerking 15–20° to the opposite side. Similar behaviour has been noted among nunlets *Nonnula* (Whittaker *et al.* 1995), and continues while observers are nearby. Such behaviour might be used to visually communicate danger between pairs (pers. obs.). Their still-hunting behaviour, combined with the fact that this puffbird seemingly vocalises infrequently (or only for short periods, especially around dawn and dusk) and its voice is quiet (and easily overlooked as an insect), means that the species is very easily missed during field surveys.

The voice is also poorly known. I tape-recorded what I presume to be the song of the subspecies *brunnescens*, first at Alta Floresta, Mato Grosso, on 12 November 1996, and subsequently twice along the rio Roosevelt, Amazonas, a series of high, thin notes forming a 4–5-second metallic trill (slowing slightly at the end), repeated every 20–25 seconds, which is similar to the only description of the species' voice (Zimmer *et al.* 1997). This loudsong is similar to that of White-whiskered Puffbird *M. panamensis* and could be overlooked as an odd-sounding Golden-crowned Spadebill *Platyrinchus coronatus* song at distance (pers. obs.). Both K. J. Zimmer (pers. comm.) and I, using a copy of my recording, have solicited silent perched *M. rufa* in Mato Grosso (nominate) and in Amazonas to respond using the same vocalisation. I also recorded a different voice in response to playback of the song, from two territorial birds along the rio Roosevelt. This voice was a louder series of fast trilled notes, with an emphatic and abrupt, louder final note, quickly repeated 8–9 times during an 11-second period, and given once or occasionally twice immediately following playback of the loudsong. The two birds approached me to within a few metres in the understorey. I assume agitated birds at territorial boundaries use this voice naturally. During their approach I noted that they seemed to puff out the breast feathers, making their striking pure white upper-breast patches appear larger and more prominent in the poorly lit understorey. Such behavior might be used in territorial disputes. Several other forest-dwelling *Malacoptila* have white upper-breast patches and inhabit the dark understorey of tropical forests (pers. obs.). Call notes of *M. rufa* are described as a high, thin descending *seeee*... (Zimmer *et al.* 1997), almost identical to alarm calls I have noted from Semi-collared *M. semicincta*, Crescent-chested *M. striata*, White-chested *M. fusca*, White-whiskered and Black-streaked Puffbirds *M. fulvogularis* (pers. obs.).

K. J. Zimmer (pers. comm.) observed a bird at Rancho Grande attending a small swarm of *Labidus* ants also attended by Black-faced Antbird *Myrmoborus myotherinus*, Scale-backed Antbird *Hylophylax poecilinota* and a pair of Warbling Antbirds *Hypocnemis cantator*, but no obligate ant followers. I also observed this puffbird feeding at the head of a large *Eciton* ant swarm at Amazonia National Park, Amazonas, with many obligate antbirds in attendance, including Harlequin Antbird *Rhegmatorhina berlepschi* and Black-spotted Bare-eye *Phlegopsis nigromaculata*, as well as Barred Forest-falcon *Micrastur ruficollis* and Dark-winged Trumpeter *Psophia viridis*.

There are apparently no recorded breeding observations of this puffbird. In upland *terra firme* at the rio Cristalino, Mato Grosso, on 8 September 2000 and 4 August 2003, after flushing birds from the forest floor, I located two nest burrows. The first was in a large bamboo patch only a few metres from a well-trodden trail. The second was in patchy bamboo and vine tangles just 30 cm from an infrequently used trail. Both were in flat terrain but the burrow entrance was constructed on a slight gradient. As in other *Malacoptila* the entrance was reinforced by *c*.30–50 dry, dead twigs of 2–10 cm, although one was 30 cm long. I have also noted such nest protection in White-chested and Crescent-chested Puffbirds, and Stiles & Skutch (1989) recorded it in Costa Rica for White-whiskered Puffbird. As well as offering at least some protection from erosion, I suggest that these sticks around the entrance may act as deterrent against terrestrial predators such as snakes. In passing over the twigs they would possibly be more likely to overlook the nest than if it was a bare-sided hole on the open forest floor. Thus, these twigs possibly help reduce nest predation, increasing nest success.

I was unable to confirm if the first nest had eggs or young, but the August nest contained two *c*.7–9-day-old chicks, just in pin with their eyes open. I measured the nest tunnel, which was oval-shaped at the exit and *c*.8 x 5 cm. The burrow sloped gently down and back for *c*.75 cm, where it curved right, and the nesting chamber was visible, with a small amount of dry vegetation in the cup lining.

CHESTNUT JACAMAR *Galbalcyrhynchus purusianus*

Known in Brazil only from the upper rio Purús and rio Juruá, Acre (Sick 1993). My records represent both a significant range extension and the first east of the rio Madeira.

The oxbow lake behind Paakas Palafitas Lodge held a resident territorial family group of six observed daily in both years. Birds were always perched on prominent vantage points, sometimes with all group members in the same tree. Still-hunting was mostly from exposed horizontal branches, often from some of the most-exposed tall trees at the edge of the *várzea* or in lone trees within the flooded oxbow. Preferred perches seemed to be in open trees, such as *Cecropia*, affording opportunities for the mostly horizontal sallies after insects. Most sallies were over 4–8 m, but some of 20–30 m were observed. Following sallies, individuals mostly returned to the initial perch. All identified prey were *Hymenoptera* wasps, bees and sweat bees.

Playback of their voice resulted mostly in the entire group, one by one, flying in to investigate (often from some distance). Upon landing, often on the same branch, they perched side by side and gave long excited rattle calls, energetically head-bobbing with their crest feathers erect and pumping their tails. The same territorial behaviour occurs in the more widespread White-eared Jacamar *G. leucotis* after playback.

BLACK-GIRDLED BARBET *Capito dayi*

Fairly common at Fazenda Rancho Grande, where it was regularly seen by K. J. Zimmer and myself, often feeding in the midstorey or canopy on small berries and *Cecropia* catkins at *terra firme* edge. Possibly less common in forested areas at Paakas Palafitas, where observed on only three occasions in *terra firme*. Stotz *et al.* (1997) noted the species as being common on the middle rio Ji-Paraná in *terra firme*, seasonally flooded forest and river-bluff forest.

Foraging observations consisted of perch-gleans to leaf and branch surfaces, often on terminal branches in the subcanopy. Prey included a large katydid or mantis that was held in the bird's claws and repeatedly jabbed with the beak before being swallowed whole. In Mato Grosso, at the rio Cristalino, I have twice observed this species (a pair and a family group) in the understorey, foraging just above the forest floor at *Eciton* army ant swarms, where they pursued escaping arthropods in dead fallen bamboo.

CURL-CRESTED ARACARI *Pteroglossus beauharnaesii*

Fairly common in *terra firme* at Paakas Palafitas, where groups were seen near-daily. However, the species was not recorded at Rancho Grande or at the two sites along the middle rio Ji-Paraná (Stotz *et al.* 1997), suggesting that the species may be patchily distributed in Rondônia and possibly is absent from some regions.

WHITE WOODPECKER *Melanerpes candidus*
Three were observed on Palafitas Island in July 2002 and, in June 2003, a vocalising pair was observed flying high above Pakaas Palafitas Lodge along the rio Mamoré before landing in second growth near the lodge. The distribution of this woodpecker in Rondônia is poorly known and these records may prove to be the first for the state. Within Amazonia the species seems very local, preferring *várzea* and mature river islands. Whereas in other parts of its range the species is found in patchy Atlantic Forest, it seems to be most abundant, in Brazil, in gallery forests of the Pantanal in Mato Grosso (pers. obs.).

POINT-TAILED PALMCREEPER *Berlepschia rikeri*
This Moriche Palm *Mauritia flexuosa* specialist was tape-recorded in extensive palm groves within a swampy area surrounded by cattle pasture at Paakas Palafitas Lodge. The species' distribution in Rondônia is very poorly known and it was not recorded by Stotz *et al.* (1997) at either of their study sites, although there are records from the upper rio Madeira (Pinto 1978).

DUSKY-CHEEKED FOLIAGE-GLEANER *Anabazenops dorsalis*
I tape-recorded and observed a lone individual of this bamboo specialist (Parker *et al.* 1997) in the understorey of *terra firme* at Parque Estadual de Guajará-Mirim, on 23 April 1995. This represents only the third documented locality for the species in Brazil. The others are Cachoeira Nazaré, where two specimens were collected (Stotz *et al.* 1997), and Alta Floresta, Mato Grosso, where it has been tape-recorded (Zimmer *et al.* 1997). In response to playback the bird approached closely, uttering a long series of fast chattering notes, with its white throat-feathers erect, wings partially open and drooping, and its crown feathers slightly raised. I have noted the same behaviour to playback at the rio Cristalino, Mato Grosso.

GREY-THROATED LEAFTOSSER *Sclerurus albigularis*
This forest dweller was tape-recorded and observed in *terra firme* at Parque Estadual de Guajará-Mirim, on 23 April 1995. K. J. Zimmer and I also made observations and tape-recordings of other individuals at Fazenda Rancho Grande in 1990–1995. The first Brazilian record was from Cachoeira Nazaré (Stotz *et al.* 1997) where it was described as rare, with one mist-netted in 1986. Two were recently collected at Alvorada do Oeste, Rondônia (Whittaker & Oren 1999). These Rondônian specimens apparently concern the subspecies *albicollis* (Remsen 2003) and not *kempffi*, which was only recently described from nearby Bolivia (Kratter 1997), as suggested by Stotz *et al.* (1997).

WEDGE-BILLED WOODCREEPER *Glyphorynchus spirurus inornatus*
Very common understorey inhabitant of *terra firme* at all sites. Rondônian birds refer to the subspecies *inornatus*, found south of the Amazon from the right bank of the rio Madeira to the left bank of rio Tapajós, extending south to northern Mato Grosso along the rio Roosevelt. The voice of this Brazilian endemic distinctly differs from nominate birds, strongly suggesting that more than one species is involved in *Glyphorynchus* (Marantz *et al.* 2003; pers. obs.), and that a thorough revision of its taxonomy is required. The most commonly heard voice of *inornatus* is two loud, clear penetrating notes, *TUE, TUE*... repeated every 5–8 seconds, and very unlike the commonly heard 'sneezing' *chief* notes of other Amazonian taxa. The complex song of *inornatus* also differs, being a more musical series, rising up the scale, with a more buzzy series of terminal notes (pers. obs.).

On 8 July 2002, while in *terra firme* at Novo Colonia I flushed an incubating *Glyphorynchus* from its nest in a hollow, broken vertical stump *c.*1.25 m high and 30 cm in diameter. The nest cup was *c.*1 m inside the stump and contained two small white eggs.

CURVE-BILLED SCYTHEBILL *Campylorhamphus procurvoides*
I tape-recorded and observed one in *terra firme* at Parque Estadual de Guajará-Mirim on 25 April 1995, presumably of the race *probatus*, which occurs on the south bank of the Amazon and east of the rio Madeira to the left bank of the rio Tapajós (Peters 1951). Parker *et al.* (1997) recorded it as rare in *terra firme* forests at Cachoeira Nazaré, with only two collected, which were the first records for Rondônia.

The voice of Curve-billed Scythebill that I tape-recorded in Rondônia was strikingly different from nominate *procurvoides*, with which I am very familiar from the north bank of the Amazon at Manaus, Amazonas. However, the Rondônian voice is identical to those I have tape-recorded at Alta Floresta, which are of the race *multostriatus* (Peters 1951) and is somewhat associated with bamboo. Tape-recordings I have made of *sanus* in southern Venezuela also distinctly differ from nominate birds and from the two south-bank forms. During extensive field work, I have found consistent and distinctly different vocal types throughout the species' range, strongly implying that more than one species is involved. I am currently reviewing vocal data and species limits in Curve-billed Scythebill.

STRIATED ANTBIRD *Drymophila devillei*
This bamboo specialist was tape-recorded in a stand of *Guadua* bamboo near the rio Formoso at Parque Estadual de Guajará-Mirim, on 26 April 1995. I confirmed by plumage characters (ochraceus underparts) and vocal differences from nominate *devillei* that these birds represented the race *subochracea*. Other state records of Striated Antbird exist only from 40 km west of Cachoeira Nazaré (Parker *et al.* 1997), where four specimens of the nominate race were taken in bamboo. Novaes (1976), however, reported specimens of *subochracea* from the nearby rio Aripuana,

and I recently confirmed the presence of this subspecies along its major tributary, the rio Roosevelt. Only *subochracea* has been found at Alta Floresta (Zimmer *et al.* 1997). Parker *et al.* (1997) noted that the distance between Cachoeira Nazaré and rio Aripuana is less than 250 km, with no apparent geographical barrier between them. These new records of *subochracea* confirm that both races occur south of the rio Ji-Paraná, with no major river barriers between the sites, and provide even stronger evidence of the theory that more than one species is involved (Zimmer & Isler 2003; pers. obs.).

Documented site records for Brazil are very few and scattered, thus any new documentation sheds light onto its Brazilian range. In 1992, I recorded a significant range extension for the species near the lower rio Juruá, along the Amazon at Caitau-uara, where I tape-recorded and observed nominate *devillei* in *Guadua* bamboo. I had previously collected the same taxon from the headwaters of the upper rio Juruá (Whittaker & Oren 1999).

Almost nothing is known of the species' breeding biology, except for a single report of a female entering an apparent domed nest in bamboo (Zimmer & Isler 2003). I observed a pair feeding a full-grown juvenile (in female plumage) at Parque Estadual de Guajará-Mirim on 27 April 1995.

THRUSH-LIKE ANTPITTA *Myrmothera campanisona subcanescens*

K. J. Zimmer and I noted, at Fazenda Rancho Grande in 1991, that the loudsong of this form is distinctly different from all other subspecies. Further extensive tape-recordings made by us throughout the range of *M. campanisoma*, including all of the Brazilian subspecies, convinced us that *subcanescens* exhibits consistent vocal differences both in loudsong and calls. We are currently examining vocal variation within the entire *M. campanisona* complex, with an eye toward possibly revising species limits. The race *subcanescens* is a Brazilian endemic found only south of the Amazon, east of the rio Madeira to the right bank of the rio Tapajós.

GREENISH ELAENIA *Myiopagis viridicata*

Fairly common in *terra firme* near Paakas Palafitas Lodge both in July 2002 and June 2003, when I tape-recorded and observed several individuals. The species typically inhabits gallery forest during the breeding season, so these records in *terra firme* outside the breeding season concern austral migrants. Stotz *et al.* (1997) recorded it as an uncommon austral migrant in low forest and second growth at Cachoeira Nazaré. The species is only a winter visitor to Peru and the states of Acre and Rondônia in north-west Brazil (Chesser 1995). Much further east it has been recorded at Alta Floresta, Mato Grosso, also in *terra firme* forest, in August (Zimmer *et al.* 1997), where it is a presumed austral migrant.

LARGE ELAENIA *Elaenia spectabilis*

Common on Palafitas Island with multiple individuals in July 2002 and June 2003. Chesser (1997) reported it as an austral migrant in Bolivia north of *c.*18°S and I recorded Large Elaenia as a common migrant breeder in *cerrado*, around Cuiabá, Mato Grosso, in September. However, in June and late-July visits I have found these areas completely lacking the species.

These presumed austral migrants were vocal, with the commonly heard single call note being tape-recorded (also heard on the breeding grounds; pers. obs.). I noted several hover-gleaning and feeding on *Cecropia* catkins on the river islands, where agonistic behaviour was also observed, suggesting territoriality on the wintering grounds. I have noted the species to be a fairly common austral visitor to successional vegetation on river islands in the Amazon and its major tributaries (pers. obs.).

PLAIN TYRANNULET *Inezia inornata*

This small tyrant flycatcher was fairly common, with multiple birds seen daily, at Guajará-Mirim in July 2002 and June 2003. Here I found the species in various habitats including on Palafitas Island, in *igapó*, second growth along the rio Mamoré and in oxbow lake vegetation. However, one was found at the edge of a small manioc field, uncharacteristically foraging 25-m high in the subcanopy of *terra firme*. Birds were rather vocal, regularly giving a long, very piculet *Picumnus*-like trill; this voice is very different from the more musical one heard in northern Argentina on the breeding grounds (pers. obs.). I have also noted this piculet-like voice commonly in the northern Pantanal, Mato Grosso, during the austral winter. Plain Tyrannulet is a known austral migrant to south-west Amazonia, with previous specimens from Rondônia (Stotz *et al.* 1997).

I believe these records refer to austral migrants, which were considered to be common in low forest at Cachoeira Nazaré in May–July by Stotz *et al.* (1997). The species is also known from the Brazilian Amazon in Acre (Chesser 1995), with unpublished observations from the upper rio Juruá in the austral winter (pers. obs). It is also reported to occur in southern Amazonian Peru (Parker *et al.* 1982) and adjacent northern Bolivia (Gyldenstolpe 1945). Chesser (1997) listed it as a winter resident at Pando, El Beni and in northern dpto. Santa Cruz, above *c.*17°S.

SUBTROPICAL DORADITO *Pseudocolopteryx acutipennis*

My observations are the first Brazilian records and certainly refer to austral migrants. All records were from Palafitas Island in the rio Mamoré. A single observed at close range on 4 July 2002 had the distinctly bicoloured bill, black on the upper mandible and pink on the lower, indicative of an immature (Ridgely & Tudor 1994). A presumed second individual, also an immature, was observed shortly afterwards, 250 m away in another part of the island. A third record involved a lone bird, on 10 July 2002, *c.*1.5 km from the original site, and this bird was documented with video footage. It had an all-dark bill and was a presumed adult. On 21 June 2003, again on Palafitas Island, a doradito, presumably Subtropical, was briefly seen by S. L. Hilty and myself.

Prolonged close studies of these three birds, for a total of *c.*11 minutes, allowed for excellent field studies. All had two pale creamy-white wingbars and a dark smudge on the cheeks, forming a darker patch that was most notable at close range. No contrast in head to back colour was noted, with a uniform olive crown, back and wings. At close range I noted the first immature as having dark eyes and blue-grey legs. The birds were inquisitive, in response to 'pishing' approaching closer in the tall cane grass, which was abundant on the island and in which they were most frequently observed. Here they regularly clung to vertical stems and occasionally perched on larger horizontal leaves at *c.*12–36 cm, sallying into the dense cane grass before reappearing minutes later and often at some distance. I observed both wing- and tail-flicking, especially when the birds were agitated or nervous. One was observed moving through a recently burnt area with 1.5 m burnt canebrake and young *Cecropia*, climbing to 3.5 m in a burnt tree before dropping to forage in low semi-burnt canebrake.

Subtropical Doradito breeds locally in the Andes from northern Colombia to north-west Argentina, spreading into adjacent lowlands during the austral winter (Ridgely & Greenfield 2001). Chesser (1997) noted that in Bolivia during the breeding season the species is found at 2,200–3,550 m, but in the austral winter it reaches the adjacent departments of Santa Cruz, Cochabamba, El Beni and La Paz, where the species occurs in May–June, August, October and December, but never above 700 m.

I suggest that the species is easily overlooked especially as it is not vocal during the austral winter. Through more ornithological field work in the state at this season, Subtropical Doradito may prove to be a fairly regular visitor to Rondônia and possibly other parts of western Amazonian Brazil.

YELLOW TYRANNULET *Capsiempis flaveola*

Several pairs were observed and tape-recorded in 2002 and 2003, at the margins of the oxbow lake at Pacaas Palafitas Lodge, where they only associated with dense stands of an unknown genus of small-leaf bamboo. An extensive area of bamboo, covering several km on the left bank of the rio Paakas Novos (following extensive deforestation), also held the species, where it was common. This active little tyrant shared such habitat with Stripe-necked Tody-tyrant *Hemitriccus striaticollis*. These records represent a range extension within Brazil from the nearest known records 600 km to the west at Alta Floresta (Zimmer *et al.* 1997), and seem to be the first documented for the state.

Yellow Tyrannulet seems to be very patchily distributed through much of Amazonia, with documented records south of the Amazon and west of the rio Madeira practically non-existent. I have collected specimens south of the Amazon at Caitau-Uara, Amazonas, in September 1992 (housed in the Museu Emilio Goeldi, Belém). These also seem to be the first documented from the rio Purús/rio Juruá interfluvium. Specimens are also known from the west bank of the rio Madeira, 60 km south-west of its confluence with the Amazon. Pacheco (1995) reported a westward range extension involving a small population at Mamiraua, Amazonas, on the north bank of the Amazon.

SOUTHERN SCRUB FLYCATCHER *Sublegatus modestus*

Singles of this rather easily overlooked nondescript flycatcher were noted on four visits to Palafitas Island in July 2002 and once in June 2003. I closely observed and tape-recorded the single rising whistled note. Field identification was based on their brighter overall appearance, more contrasting underparts and bolder pale wingbars, versus the very similar but duller Amazonian Scrub Flycatcher *S. obscurior*. In Amazonia, Amazonian Scrub Flycatcher seems to be found strictly in upland tropical forest, where it inhabits open canopy, large treefall clearings, natural or man-modified forest edge, and in *várzea* on floodplains close to major rivers where dense *Guadua* bamboo occurs in the understorey (pers. obs.).

Southern populations (*brevirostris*) are at least partially migratory with winter records from Amazonian Peru, in Ucayali and Madre de Dios (Ridgely & Tudor 1994). Stotz *et al.* (1997) reported *S. modestus* as a rare austral migrant in second growth at Cachoeira Nazaré, and it was found during the austral winter in Bolivia north of 17°S, in June–September (Chesser 1997). During the austral winter I have observed migrant *modestus* in large stands of *Guadua* bamboo in Manu National Park, Madre de Dios, Peru, in river floodplains within *várzea*. Here, during the austral winter, I have found *modestus* to be syntopic with resident Amazonian Scrub Flycatcher, which was once considered a subspecies of *modestus* (Traylor 1982).

ZIMMER'S TODY-TYRANT *Hemitriccus minimus*

This easily overlooked tyrant flycatcher was located by its distinctive voice, and tape-recorded and observed at the Taquaras *campina* forest, where two territorial birds were noted in July 2002 and June 2003. Singing in the higher forest substrate, its insect-like vocalisation is easily overlooked until known. This behaviour, combined with it inhabiting mostly forest canopy and subcanopy (only rarely coming lower), confirms why the species mostly is under-recorded. Now that field ornithologists are familiar with the voice, its known range has been greatly expanded (Zimmer *et al.* 1997, Cohn-Haft 2000, Borges *et al.* 2001). I have tape-recorded the species in Mato Grosso, at Fazenda Esperanca (near Bom Jesus de Araguaia) and at Xingu Refugio Amazônica, the rio Von Den Steinen, and K. J. Zimmer and I also tape-recorded it at Borba, in Amazonas, at Amazonia National Park, Caxiuanã and Carajás, all in Pará, and at Caseara, in Tocantins. The latter record is the first documentation of the species east of the rio Tocantins.

BUFF-CHEEKED TODY-FLYCATCHER *Todirostrum senex*

Despite being considered 'unknown in life' (Ridgely & Tudor 1994), I was able to identify the species based on familiarity with its vocalisations and appearance acquired at the type locality, where M. Cohn-Haft and B. M. Whitney (pers. comm.)

rediscovered it several years ago. They kindly alerted me to its presence and are currently preparing a paper concerning its natural history and taxonomic affinities.

On 12 July 2002 I located this little-known species at Taquaras by virtue of its distinctive voice (a rather loud, dry metallic trill) in dense stunted *campina*-type forest. Here I observed and tape-recorded several individuals, initially in July 2002 and again on 25 June 2003. This *campina* is on white sand and weathered clay that is poorly drained. I also found Zimmer's Tody-tyrant *Hemitriccus minimus* sympatric with Buff-cheeked Tody-flycatcher. Zimmer's Tody-tyrant mostly foraged in the higher forest substrate, whilst vocally Buff-cheeked Tody-flycatcher was the commoner of the two.

Even though July is the dry season here, the stunted *campina* had several small pools and muddy areas, and in June 2003 was even wetter, confirming that the area is flooded during the wet season (November–April). The canopy was fairly uniform in height (8–12 m), with low tree species diversity, dominated by 1.25–2.5-m *Melastoma* spp. in the understorey, with some of the forest floor covered by moss and low terrestrial bromeliads.

Following playback, two *T. senex* permitted approach to 3–4 m while they foraged in the fairly open understorey. They spent long periods foraging in *Melastoma* at 1–2 m, but also in lower branches of trees up to 4–5 m. Audible wing-whirr was very noticeable as they flew between perches and could be heard at 15–20 m. I noted short sally-gleans of 0.5–2.0 m to live leaves and occasionally to branches or trunks, and a 5-m diagonal sally was observed. The only identified prey was a 1-cm green *Orthoptera*, which was held in the beak and bashed repeatedly against a branch before being swallowed whole.

These records, along with unpublished observations by M. Cohn-Haft and B. M. Whitney (pers. comm.) from further north in Rondônia, are the first state records. My records represent a range extension of *c*.850 km south-southwest of Borba, the type locality. I have also recently tape-recorded the species along the lower rio Roosevelt, at Pousada Rio Roosevelt, Amazonas (08°29'S, 60°57'W), extending the known range further east. Whether the Rondônian or rio Roosevelt birds represent disjunct populations or whether the species is continuously distributed over this region, perhaps even in suitable habitat in adjacent Bolivia, requires further field and museum work.

Recent field work in white-sand areas has resulted in several noteworthy ornithological discoveries, including new taxa and rediscoveries (Whittaker 1994, Whitney & Alvarez Alonso 1998, Isler *et al.* 2001), re-emphasising the exceptional conservation importance of these unique forests. Alarmingly, from July 2002 to June 2003, subsistence farmers at Taquaras cleared several pristine areas of *campina* holding *T. senex*. Unfortunately, the ever-increasing human population of the area and the economic value of white-sand soil for the building construction trade, combined with subsistence farming, are now threatening this habitat before it has been biologically surveyed, much less protected.

FUSCOUS FLYCATCHER *Cnemotriccus fuscatus*
Very common and vocal around Paakas Palafitas on both visits, in *terra firme* clearings and along roads lined with bamboo through *terra firme*, second growth, *várzea* edge, river islands and *igapó*. Apparently a fairly common austral migrant to western Rondônia, residents in Amazonia occur only in early-successional vegetation on river islands (pers. obs). Stotz *et al.* (1997) recorded the species as a rare austral migrant at Cachoeira Nazaré, in lowland forest.

EULER'S FLYCATCHER *Lathrotriccus euleri*
Presumed austral migrants were uncommon and not very vocal in second growth bordering *terra firme* and *igapó* around Paakas Palafitas Lodge, in July 2002 and (rare) in June 2003. Interestingly, Euler's Flycatcher was found to be absent from the middle rio Ji-Paraná sites a little further north (Stotz *et al.* 1997).

OLIVE-SIDED FLYCATCHER *Contopus borealis*
This boreal migrant was observed at Rancho Grande on 29 and 31 January 1993, 24 January and 3 November 1995. All records were from the *terra firme*/second-growth ecotone, where they perched high in the canopy (mostly on dead snags). These are perhaps the first records for Rondônia, although scattered records are available from elsewhere in Amazonia (Cohn-Haft *et al.* 1997), and I have unpublished records from Alta Floresta (Mato Grosso) and the Serra dos Carajás (Pará).

VERMILION FLYCATCHER *Pyrocephalus rubinus*
Around Paakas Palafitas Lodge this distinctive tyrant flycatcher was very common in June 2003 and uncommon in July 2002. Several males were recorded in heavy body and tail moult. This species is an austral migrant, inhabiting *terra firme* edge, river islands and cattle pasture. Reported as a winter visitor to most of Bolivia except the extreme south (Chesser 1997). At Cachoeira Nazaré it is a rare austral migrant in second growth (Stotz *et al.* 1997).

LITTLE GROUND-TYRANT *Muscisaxicola fluviatilis*
This species' range in Brazil is very poorly known, with only two historical specimens—from Crato (just north of Humaitá), on the left bank of the rio Madeira, Amazonas, on 14 November 1829 (Pelzeln 1870); and at Milho, on the rio Jiparaná (*c.*150 km south-east of its mouth), Rondônia, on 19 June 1908 (Hellmayr 1910)—and several recent sight records. I recorded it as fairly common at Palafitas Island, in July 2002, where 3–4 were seen, mostly on sandbars, exposed mudbanks and occasionally in low scrubby successional vegetation close to the river's edge. However, in June 2003 only one was found. Stotz *et al.* (1997) reported the species as rare at Cachoeira Nazaré and other reports come from observations by P. Roth along the upper rio Aripuana, Mato Grosso in August–October (Pacheco 1994). Recent sightings from Amazonas include singles near Tefé, on 1 July 1993, and 30

km west of the lower rio Japurá, on 15 July 1993 (Pacheco 1994). I have unpublished records of several individuals along the upper rio Juruá, at Eirunepé, on 10 October 1991. Interestingly, all these records fall within the period of austral migration. Sick (1993) suggested that the species might appear in Brazil only during migration.

HUDSON'S BLACK-TYRANT *Knipolegus hudsoni*

On 20 June 2003, on Palafitas Island, I observed an adult male, and the following day S. L. Hilty and I observed both an adult male and female-plumaged bird. The adult male was territorial, repeatedly chasing the female-plumaged bird through low *Tessaria* scrub. However, males possess a female-type plumage following post-juvenile moult (Fjeldså & Krabbe 1990), and thus females cannot certainly be separated from young males in the austral winter.

This species is an austral migrant to Brazil, previously recorded only from Mato Grosso, at Descalvados, in the Serra do Roncador in August–September (Sick 1985). It breeds in *chaco* woodland in central Argentina, from Córdoba south to Río Negro and south-west Buenos Aires provinces. Austral migrants are also known from nearby Bolivia, with a few records from Paraguay (Hayes 1995).

Formerly considered Near Threatened (Collar *et al.* 1992), I believe these river island observations are important, as they confirm yet another habitat for the species on its wintering grounds. During the austral winter, migrants have been reported from trees and bushes at woodland and road edges in Beni, Bolivia (Brace *et al.* 1996), and from Santa Cruz in *chaco*, weedy pasture and even gardens (Parker 1989). S. L. Hilty and I have recorded it in hedges, overgrown pasture and near windbreaks by sewage ponds in Santa Cruz.

BLACK-BACKED WATER-TYRANT *Fluvicola albiventer*

One observed on 11 July 2002 on Palafitas Island was feeding at the water's edge on exposed mudbanks. Recorded as a winter resident in Bolivia, from adjacent Santa Cruz and El Beni in June–November (Chesser 1997), and Peru (Parker *et al.* 1994), in Brazil it is an austral migrant to Acre, Rondônia (Chesser 1995) and south-east Mato Grosso (Willis & Oniki 1990).

RUFOUS CASIORNIS *Casiornis rufa*

Three records of this austral migrant: one observed and tape-recorded in the canopy of *terra firme* on the edge of a man-made clearing near Paakas Palafitas Lodge on 9 July 2002; a second heard in the canopy of *igapó* at Nova Colonia on 10 July 2002; and the last, a silent individual, in the Taquaras *campina* forest on 26 June 2003. Reported in low forest from the middle rio Jiparaná at Cachoeira Nazaré, where specimens were obtained in May and June (Stotz *et al.* 1997). Other Brazilian Amazon records (north of the Amazon) are from northern Pará (Snethlage 1914) and in gallery forest *c*.50 km south of Porto Grande, Amapá (K. J. Zimmer, pers. comm.). South of the Amazon in Brazil the species is known from Acre (Stotz *et al.* 1997) and Alta Floresta, northern Mato Grosso, in September, in isolated small deciduous forests on rocky outcrops within *terra firme* (Zimmer *et al.* 1997).

PALE-BELLIED MOURNER *Rhytipterna immunda*
At Taquaras *campina* 2–3 of this easily overlooked species were located in low, stunted and poorly drained sandy/clay forest by virtue of their distinctive voice, which was tape-recorded. Their resemblance to *Myiarchus* flycatchers, as already reported (Ridgely & Tudor 1994, Zimmer & Hilty 1997), is striking. In response to playback, they were rather shy and retiring, flying to the canopy of 8–10-m trees, where they briefly perched very alert before quickly retreating from sight. These documented records seemingly are the first for Rondônia. Known from specimens in the Museu Emílio Goeldi (Belém) taken in *campina* near Borba further down the rio Madeira, the nearest Brazilian records are from southern Mato Grosso (Ridgely & Tudor 1994).

BROWN-CRESTED FLYCATCHER *Myiarchus tyrannulus*
Remarkably common austral migrant with multiple birds recorded daily, although far more often heard than seen, as found mostly high in the canopy of *terra firme*. Also recorded in the canopy of *várzea* on mature river islands and along wooded banks of the rio Mamoré. Apparently present only in winter (June–October) in adjacent northern Bolivia (Chesser 1997). At Cachoeira Nazaré presumed austral migrants were recorded twice in low forest in June. At other Amazonian sites in Brazil, known from specimens taken in the austral winter in Acre and Rondônia (Chesser 1997) and at Alta Floresta, Mato Grosso, in August–September (Zimmer *et al.* 1997). However, there are isolated resident breeding populations in Amazonian savannas, at Alta do Chão, Pará (Sanaiotti & Cintra 2001) and the lower rio Xingu, including Parque Indigena do Xingu (pers. obs.). The complete lack of other published records outside the austral winter from most of the Amazon basin confirms that the species is almost exclusively an austral visitor to the Brazilian Amazon and that it is commoner in south-west Amazonia.

YELLOW-THROATED FLYCATCHER *Conopias parva*
This canopy flycatcher was very uncommon at Nova Colonia, on 8 July 2002, and was observed and tape-recorded at Taquaras *campina*, on 12 July 2002, where it was found accompanying a small mixed-species flock. The record from Nova Colonia, in south-west Rondônia, quite probably represents the species' southernmost locality.

The species' canopy habits, where it occurs exclusively in the upper strata mostly of *terra firme*, make it especially prone to be overlooked (Whittaker & Oren 1999, Alvarez Alonso & Whitney 2003), unless its distinctive voice is known (pers. obs.). Until recently, this has caused large gaps and poor representation of its true range in the literature, especially south of the Amazon (Ridgely & Tudor 1994). Brazilian records south of the Amazon are one from Urucu, Amazonas (Peres &

Whittaker 1991) and the upper rio Juruá, Acre (Whittaker & Oren 1999), the latter overlooked by Alvarez Alonso & Whitney (2003). However, Alvarez Alonso & Whitney (2003) reported a series of new observations by B. M. Whitney south of the Amazon in Brazil, from the west bank of the lower rio Tapajós west to extreme western Acre, and south along both banks of the rio Madeira in northern Rondônia. I also have voucher tape-recordings documenting Yellow-throated Flycatcher south of the Amazon, from Amazonas along the rio Mapiá, near Borba, and in the extreme west of the state on the Peruvian border, along the rio Javari, at Palmari Lodge, in August 2002. Recent north-bank records from west of the rio Negro are available from Jaú National Park (Borges *et al.* 2001). I also have tape documentation both north and south of Jaú National Park, with a pair *c*.35 km east of Manacapuru, Ziggylandia, and a nesting pair tape-recorded and observed at Barcelos, Amazonas, on 20 December 1997. This pair was seen carrying nest material to a hollow 20 m up in an isolated tree, in second growth some 100 m from virgin *terra firme*.

I found Yellow-throated Flycatcher and Three-striped Flycatcher *Conopias trivirgata* together at Ziggylandia, Amazonas, where I have observed both in the canopy of *terra firme*, but never in the same canopy flock. Possibly *C. trivirgata* is more restricted, in these areas, to black-water transition (only occasionally venturing into *terra firme*), which borders *terra firme*, and *C. parva* is exclusively restricted to upland *terra firme*.

Increased field work by ornithologists familiar with Yellow-throated Flycatcher's voice will surely bring greater insight into its precise Amazonian range. However, the reported absence in Rondônia from both the middle rio Ji-Paraná (Stotz *et al.* 1997), and Rancho Grande, where experienced field workers familiar with its voice have failed to find it, suggests that the species is rather local and patchily distributed east of the rio Madeira. The species' patchy distribution was also noted by Alvarez Alonso & Whitney (2003), who suggested that it occurs only in forests on sandy and other nutrient-poor soils.

YELLOW-BROWED TYRANT *Satrapa icterophrys*

One observed by S. L. Hilty and I on Palafitas Island, on 20 June 2003, in early-successional growth including *Tessaria* and canebrake, seemingly represents the first state record and presumably was an austral migrant. Chesser (1997) reported Yellow-browed Tyrant as an austral migrant (June–October) to northern Bolivia. Amazonian records are few, although Ridgely & Tudor (1994) reported it to be less numerous further north, where it apparently occurs only as an austral migrant, noting one record from Manaus, Amazonas. This record involved a bird I observed nest building at Machantaria Island, in the Amazon, on 30 August 1992. Subsequent visits, over several years by various ornithologists, failed to produce any further records on this or other nearby river islands. I therefore suggest this breeding record to have been exceptional. In the northern Pantanal, Mato Grosso, it is a not uncommon austral migrant (pers. obs.).

BLACK-NECKED RED-COTINGA *Phoenicircus nigricollis*
Two observed and tape-recorded by S. L. Hilty and myself in *terra firme* near Paakas Palafitas Lodge, on 23 June 2003, was the second state record, following the report of one observed and tape-recorded at Parque Estadual de Guajará-Mirim, in April 1995 (Whittaker 1996a). It seems highly probable that the species also occurs in adjacent north-east Bolivia.

BLACK MANAKIN *Xenopipo atronitens*
This sandy soil specialist was fairly common in the Taquaras *campina*, where several adult males and female-plumaged birds were observed and tape-recorded. This seems to be the first state record, with the nearest known populations being in north-east Bolivia, in Santa Cruz, on the Serranía de Huanchaca (Ridgely & Tudor 1994). In Brazil the nearest site for *Xenopipo* is in south-west Mato Grosso (Ridgely & Tudor 1994). My record represents a range extension within the Madeira drainage of *c*.850 km from Borba, from where there are specimen records (Pinto 1944).

SOUTHERN ROUGH-WINGED SWALLOW *Stelgidopteryx ruficollis*
Presumed austral migrants involved flocks of 50+ along the rio Mamoré, in July 2002, swelling local residents, which almost never flock (pers. obs.). However, no large numbers were noted in June 2003. Southern populations are migratory, moving north in Brazil (Pereyra 1969), with birds from Rio Grande do Sul largely absent in mid February to mid August (Belton 1985). I have also observed larger numbers of the species, with flocks of over 100, along several major Amazonian rivers in the austral winter (pers. obs.). However, the full extent of their winter range in the Amazon is unclear and difficult to document due to the species being a common resident throughout the region.

TOOTH-BILLED WREN *Odontorchilus cinereus*
This canopy species was observed and tape-recorded near Paakas Palafitas Lodge in mixed-species canopy flocks in *terra firme*, where it was fairly common and very vocal, especially in June 2003. R. S. Ridgely, K. J. Zimmer and I found it very common at Fazenda Rancho Grande, where on 25 April 1991 a pair was observed carrying twigs to a nest cavity 20 m high at the edge of *terra firme*. The pair was also seen in courtship display and any other birds approaching the nest were chased aggressively. Stotz *et al.* (1997) reported the species as common at Cachoeira Nazaré and uncommon at Pedra Branca. At Alta Floresta, Mato Grosso, Zimmer *et al.* (1997) reported it to be uncommon. The species also occurs in adjacent north-east dpto. Santa Cruz, Bolivia (Bates *et al.* 1989, 1992).

CREAMY-BELLIED THRUSH *Turdus amaurochalinus*
Austral migrants to Rondônia were recorded as rather uncommon around Paakas Palafitas, mostly in second growth and *terra firme* edge. Further north, it was absent

at Pedra Branca and uncommon at Cachoeira Nazaré (Stotz *et al.* 1997). However, the species is mostly absent or very rare east of here in Amazonia (pers. obs.). Recorded as common 700 km to the south-east, where up to 10,000+ roost annually in the bamboo understorey of *terra firme* at Flor del Ouro, Noel Kempff Mercado National Park, Santa Cruz, Bolivia, in July (S. L. Hilty & A. Whittaker pers. obs.).

PEARLY-BREASTED CONEBILL *Conirostrum margaritae*

I initially observed an adult feeding an immature in low *Cecropia* on a Bolivian river island adjacent to Palafitas Island, in the rio Mamoré, on 11 July 2002. In June 2003, S. L. Hilty and I documented this new record for Bolivia when we tape-recorded and observed several small groups on the same island in *Cecropia*-dominated stands of trees. I also observed and tape-recorded a pair of Chestnut-vented Conebills *C. speciosum* in the same *Cecropia* stand. On the Amazon, near Manaus, at Machantaria Island, Amazonas, I have recorded Pearly-breasted, Chestnut-vented and Bicoloured Conebills *C. bicolor*, which might represent the first documentation of these conebills occurring syntopically.

The most commonly heard voice is a complex series of fast musical twittering notes, which sounds as if several birds are singing concurrently, but often involves only a single bird singing within a small group. I have found the species to always be very responsive to playback.

This appears to represent the first record for Bolivia. Previously, *C. margaritae* was known only from the lower rio Madeira near Borba (Peters 1968), where I observed it in 2001. Known elsewhere in Brazil from along the middle Amazon, from the mouth of the rio Jamundá to the mouth of the rio Negro (Ridgely & Tudor 1989), the Bolivian records represent a range extension of *c.*1,050 km. Pearly-breasted Conebill probably has a continuous range along the entire Amazon in Brazil, a supposition supported by my tape-recordings and specimens from Caitau-Uara, in September 1992, which extended the range some 600 km west.

SLATE-COLOURED SEEDEATER *Sporophila schistacea*

Several singing adult males and immature males (in female plumage) were tape-recorded, and small loose flocks of 5–8 were observed, at Paakas Palafitas in June 2003. They were associated with small agricultural clearings in *terra firme*, especially where dry-land rice was being cultivated. Two or three were also observed at Parque Estadual Guajará-Mirim in forest borders close to small patches of bamboo and overgrown cattle pasture. An adult male tape-recorded singing on 27 January 1995 at Rancho Grande was the only record for the site; it frequented a recently burned forest edge bordering grassland.

At Paakas Palafitas males were observed singing mostly from concealed perches at the forest edge, usually at 4–8 m, but reaching 11–12 m after playback. Singing birds were very territorial, being extremely responsive to playback and affording excellent close studies. The large yellow bill was very obvious on adult males, which showed pink gapes when singing. Other field marks noted on this basically grey bird were the two small symmetrical white spots on the lower neck and darker grey centre to the throat, with a white mid belly.

Previously recorded in Rondônia only from Cachoeira Nazaré, where it was reported as rare (only two March records) and fairly common at nearby Pedra Branca in *terra firme* and secondary forest, in February (Stotz *et al.* 1997). Stotz *et al.* (1997) suggested the species might be nomadic, as found by Parker *et al.* (1982) in south-east Peru. In Costa Rica, Willis & Eisenmann (1979) and Stiles & Skutch (1989) noted that Slate-coloured Seedeater is possibly an irruptive species following bamboo seeding, as in Panama. However, my observations, and those of Stotz *et al.* (1997) in Rondônia, confirm that the species also occurs in areas lacking bamboo, as at two of the sites where I located it bamboo was absent. In Acre, west Amazonian Brazil, Whittaker & Oren (1999) found the species to be only associated with bamboo.

Recent deforestation in Rondônia and elsewhere in the Amazon has resulted in the cultivation of dry rice in small agricultural settlements, which seems to be a very important alternative food resource for the species (pers. obs.). Stotz *et al.* (1997) noted that stomach contents of nine specimens taken at Pedra Branca contained rice, which was being harvested. This newly available food, combined with increasing bamboo as a result of the creation of forest gaps (Janzen 1983, Marcus 1983), may lead to an increasing and more widespread population of the species within Amazonia.

DARK-THROATED SEEDEATER *Sporophila ruficollis*

S. L. Hilty and I observed an adult male at Palafitas Island on 20 June 2003, along with three unidentified female seedeaters. In Brazil known previously only from Mato Grosso, Goiás, São Paulo and in Minas Gerais, at Pirapora in September (Sick 1985). This is apparently the first state record and confirmation that the species occurs on river islands in early-successional growth. Significant numbers have been recorded in Bolivia at Noel Kempff Mercado National Park, some 700 km to the south-east, with estimated numbers reaching 16,160 (Pearce-Higgins 1996).

RUFOUS-RUMPED SEEDEATER *Sporophila hypochroma*

S. L. Hilty and I observed an adult male of this Near-Threatened species on Palafitas Island on 19 June 2003. It was perched atop a 6-m *Tessaria* in sunlight, and its calls were tape-recorded. This bird was in an area of early-successional vegetation with much seeding grass and sedges. For comparison, we recorded at least three other species of unidentified female-plumages seedeaters associated with several adult male Chestnut-bellied Seedeaters *S. castaneiventris*.

The few documented records of this rare species in Brazil are from the southern Pantanal, east of Corumbá, Mato Grosso do Sul, at Emas National Park, Goiás, in October 1979, and south-west Goiás, in October 1984 (Ridgely & Tudor 1989). I photographed an adult male in the northern Pantanal, at Pixiam, Mato Grosso, on 4 November 1996, in flooded grassland bordering a small marsh. Ridgely & Tudor

(1989) suggested that the species might be an austral migrant. The Rondônia record confirms that the species certainly wanders further north in the austral winter, but to what extent and how important river islands are to this species at this season is unknown. It also represents a new state record and a significant extension of its known range. The species is, however, known to be a regular austral migrant *c*.700 km south-east in Noel Kempff Mercado National Park, Bolivia, where estimates of 4,480 individuals were reported in August–September 1994 (Pearce-Higgins 1996).

YELLOW-SHOULDERED GROSBEAK *Parkerthraustes humeralis*
Fairly common in mixed-species canopy flocks at Fazenda Rancho Grande. Reported as uncommon at Cachoeira Nazaré (Stotz *et al*. 1997). On 25 April 1990, at Fazenda Rancho Grande, I observed two in the canopy of *terra firme* in the bare crown of an emergent, with sluggish movements, sallying 1–3 m after a hatch of winged termites or ants.

To my knowledge there are no known breeding records of the species. Whilst observing a pair in the upper midstorey of *terra firme* at Parque Estadual de Guajará-Mirim, on 24 April 1995, I noted one carrying a *c*.3.5 cm-long green leaf to the crown of a 35–40-m emergent. Two further nesting records are from Alta Floresta, Mato Grosso: in early May 2003, A. Lees (pers. comm.) observed one carrying nesting material in the canopy, and on 29 June 2003 A. Kirschel (pers. comm.) watched a pair repeatedly carrying large green leaves to the crown of a 50-m emergent in *terra firme*.

The most frequently heard vocalisation is a high-pitched two-syllable note (easily overlooked), the second note rising in pitch, repeated every 3–7 seconds, often from an exposed forest canopy perch. In response to playback from canopy towers, I have observed birds puff out their plumage, cock the tail almost vertically and hold it there, while flicking their wings and exposing their striking yellow shoulders (which are normally partially concealed). Maintaining this odd stance, birds often sang a more complex series of musical twittering notes (similar to the song of Palm Tanager *Thraupis palmarum*). I have also tape-recorded this complex voice, without playback, in the canopy of *terra firme* in early December at the rio Cristalino, Mato Grosso.

Remarks

The results of this survey augment the growing pool of knowledge concerning Rondônia avifauna, but most of the state is still ornithologically extremely poorly known (Oren & Albuquerque 1991). The recent discovery of a new primate in the state (Ferrari & Lopes 1992) further emphasises the necessity of further field work. The results of my preliminary ornithological surveys again underline how little is known of the state's avifauna and how much remains to be discovered. Initial surveys of a white-sand forest *campina* in Rondônia have discovered the poorly known Buff-cheeked Tody-flycatcher and several other specialists of this habitat not previously recorded in the state. Soil mosaics within the Amazon basin are complex and dramatically modify vegetation types (Gentry 1988), which in turn have a major effect on the fauna and play an important role in defining species distributions throughout the Amazon (Gentry 1990).

These results emphasise not only the importance of these *campina* and *campinarana* forests for endemic and poorly known birds, but also how fragile they are to human disturbance. Rondônia's ever-increasing population and expansion into untouched natural areas of the state requires immediate attention from conservation organisations or the future of its rich biodiversity and endemic fauna and flora may prove very bleak. A major inventory of plants and animals and their ecological requirements is urgently required throughout Rondônia, encompassing all of the major biomes, to establish priority areas for future conservation.

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I dedicate this paper to the memory of my father, Victor Nuttall Whittaker, who introduced me to the wonders of the natural world, especially birds. He constantly encouraged and helped me learn more about birds through his own self-taught knowledge. Unselfishly giving up his free time to drive me to bird ringing meetings, he also enrolled us both on ornithology night classes for two years, with me the youngest in the class by far. This decision was a crucial one, allowing me to mature as an ornithologist. Many of my most memorable childhood moments were birding with my father and mother in the UK, and on night class outings and family holidays in Europe. He is greatly missed.

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Age- and sex-differentiated plumages in the two colour morphs of the Variable Buzzard *Buteo polyosoma*: a case of delayed maturation with subadult males disguised in definitive adult female plumage

by José Cabot & Tjitte de Vries

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The polymorphic plumage of Variable Buzzard *Buteo polyosoma* has generated a long and complicated controversy regarding the species' taxonomic classification (Vaurie 1962). Initially described as *Falco polyosoma* Quoy et Gaimard 1824, it has subsequently been referred to variously as *Haliaeetus erythronotus* King 1827; *Aquila braccata* Meyen 1834; *Buteo varius* Gould 1937; *Buteo unicolor* Lafresnaye & d'Orbigny, 1837; *Buteo erythronotus* Taczanowski, 1877; *Buteo tricolor* d'Orbigny (p.106 in Hellmayr 1932); *Buteo melanosthetus* (*os*) Philippi, 1899; *Buteo poecilogaster* Philippi, 1899; *Buteo macronynchus* Philippi, 1899; *Buteo ater* Philippi, 1899; *Buteo pictus* Philippi, 1899; *Buteo aethiops* Philippi, 1899; and *Asturina aethiops* Philippi, 1899. The number of synonyms is due, in part, to the fact that different plumage patterns were thought to represent different species.

Since Gurney's (1879) description of *Buteo poecilochrous*, a long debate has ensued as to the species' relationship with *B. polyosoma*. This is to some extent understandable since several plumages of these taxa are virtually identical and there is an overlap in some measurements. Furthermore, they occur at the same altitudes—albeit in different habitats—in the Bolivian altiplano during the austral winter (Cabot & Serrano 1986, Cabot 1991). The two were for a long period differentiated on the basis of the relative distances between the tips of the third- and fifth-outermost primaries (Stresemann 1925), a feature subsequently disproved, leading to them being regarded as conspecifics (Farquhar 1998). Cabot & de Vries (2003) analysed the morphology and ecological behaviour of the two, proving their clear separability using other measurements and that they behave as species under the Biological Species Concept, although DNA studies have revealed their close similarity (Riesing *et al.* 2003), indicating that recent parapatric differentiation at high altitude in the Andes culminated with the retreat of the ice-packs at the close of the last glacial period, as suggested by Haffer (1967) and Dorst & Vuilleumier (1986) for birds of this region. These two species have the lowest known wing-loads of their genus (Cabot & de Vries 2003), an adaptation to the low atmospheric pressure in high-altitude ecosystems.

The plumage of *Buteo polyosoma* (and *B. poecilochrous*) was studied by Vaurie (1962), who established that adults of *B. polyosoma* are of five different types. He also noted sexual dimorphism and that adult females have a red back, whilst males have a uniform grey back, although some possess a red patch as in females. The types defined by Vaurie (1962) are as follows. Type A: head, thighs and undertail-coverts dark brown or dark slate, with mantle and rest of underparts chestnut and unbarred. Type B: crown, nape and mantle the same colour as type A, but underparts white with narrow dusky-brown or grey bars that vary in intensity from broad and dense to unappreciable. Type C: body plumage including underwing-coverts grey (from pale slate to virtually black), with 50% having scattered reddish feathers on the mantle. Type D: upperparts grey and underparts and underwing white, with some showing some chestnut at the upper border of the mantle. Type E: crown and nape as in types A and B, but with variegated underparts: ventrally grey and brown, transversal pectoral band chestnut and rest of underparts and thighs having slate- and white-coloured bars.

Pávez (1998) was first to describe the plumages of the pale phase of *B. polyosoma* and to relate different plumages to age. His study was based on plumage changes in captive Chilean birds from the first year and his results established that: (1) definitive adult plumage is reached more or less in the sixth year; (2) plumages are related to an age-dependent pattern of markings and coloration; (3) males between third and fifth years show some transitory characters, such as a reddish mantle, which correspond to definitive female plumage; and (4) definitive adult plumage is sexually dimorphic: males have a uniform grey back, females a brick-red patch.

Here we describe, for the first time, sex- and age-related plumage changes in the dark morph, and also include a more specific description of colour patterns for the entire distribution of the pale morph, as described by Pávez (1998) for Chilean birds. Finally, the colour phases are established for the different ages (1–6 years).

Material and methods

We examined 160 specimens held at the Natural History Museum (Tring), Museum of Natural History (Stockholm), Zoological Museum (Copenhagen), Landes Museum (Linz), Museum d'Histoire Naturelle de Genève (Geneva), Museo Regionale di Scienze Naturali (Turin), Institut Royal des Sciences Naturelles de Belgique (Brussels), Muséum National d'Histoire Naturelle (Paris), Estación Biológica de Doñana (Seville), Museo Nacional de Ciencias Naturales (Madrid), Museo Ecuatoriano de Ciencias Naturales (Quito), Museo de Ciencias Naturales "Mejía" (Quito), Museo de la Escuela Politécnica Nacional (Quito), and Museo Nacional de Ciencias del Instituto Técnico Superior "Bolivar" (Ambato, Ecuador). Specimens were available from Colombia (two), Ecuador (20), Peru (seven), Bolivia (24), Argentina (49), Chile (29) and the Falklands (21); four were of unknown origin. Four specimens of *Buteo polyosoma exsul* from the Juan Fernández Islands were examined as comparative material.

Some controversial and undated skins were identified and sexed on the basis of secondary length, wing length, wing depth and the shape of the wingtip, as per the range of values given by Goodall *et al.* (1951), de Vries (1973), Cabot (1991) and Cabot & de Vries (2003). The Stresemann criteria for distinguishing the species from *B. poecilochrous* were not used, as they are not diagnostic (Farquhar 1998, Cabot & de Vries 2003). Birds were classified according to similarities in plumage marks and coloration, enabling us to create a fixed number of categories that included all plumage types. Overall, these categories were relatively homogenous, despite the high degree of individual and geographical variation within plumages. In uniformly coloured areas of plumage, differences lie in ground-colour tones, as well as in their extent and distribution. Markings also vary in size, density and distribution. The age-related sequence of plumages was established from those birds that presented intermediate characteristics, denoting the change from one plumage category to another as feathers are replaced. The sequence of plumage changes was established by the simultaneous presence of old and new feathers, which were identified by wear on their distal edges or by differences in tone when the ground colour was similar. Changes in size, colour and distribution of markings were also taken into account, especially on the underparts.

Moult patterns were not subject to close scrutiny. Captive birds in southern Iberia moulted in mid May and late September. Nevertheless, these periods may not correspond to moulting periods in their country of origin (Peru). Like Pávez (1998), we detected no protracted moult in the species. Neither were we able to discover how much individual variation—as occurs in large eagles—there is in the time birds take to acquire adult appearance.

Specimens were photographed dorsally, ventrally and laterally and the images, once classified by age and sex, permitted comparative analysis between skins housed in different museums. Descriptions of the plumages of 12 live birds (three juveniles, two subadults and seven adults) in private zoos and raptor centres were made by means of twice-annual visits over three consecutive years to monitor changes. Live birds were sexed using molecular techniques (Ellegren 1996). The most distinctive plumage characteristics of the two morphs, including sexual differences, are given in Table 1.

Dark morph

First-year: variable but sexes alike. Entirely dark chocolate-brown to uniform blackish brown, sometimes with cheeks paler and tinged tawny; crown and nape feathers have white bases visible on nape; mantle usually uniform; upperwing-coverts and scapulars have profuse and contrasting ochre or grey-ochre markings; secondaries dark-barred and distally pale-fringed; outermost primaries with blackish-brown tips, and ochre or creamy notches, especially on inner web; rump and uppertail-coverts dark chocolate-brown with concealed pale ochraceous or tawny spots; underparts with whitish to ochre-tawny spots, principally on mid and rear underparts, decreasing in size and merging into pale, scattered spotting on thighs and undertail-coverts; lesser and median underwing-coverts dark brown with

TABLE 1

Diagnostic characters according to age and sex in pale and dark phases of *Buteo polyosoma*.

AGE	DARK PHASE	PALE PHASE
First-year	Appearance wholly brown to blackish brown; upperparts marked ochre or grey-white; underparts sparsely pale or white spotted. Tail: above greyish brown with usually 14–18 close, narrow, irregular dark bands.	Malar stripe and upperparts dark brown with tawny-ochre markings; supercilium, cheeks and underparts pale ochraceous with dark streaks on throat and breast-sides; rest of underparts and thighs have brownish diamond-shaped marks which progressively decrease in size, merge and become more widely spaced towards tail; tail more brownish than in first-year dark phase.
Second-year	As first-year but darker and more blackish, less brown; more uniform; scattered marks on upperwing-coverts, tail has same pattern but slightly greyer than in previous plumage.	As first-year but mid and rear underparts reticulated or boldly marked with rufescent-brown to rusty-orange bars, which decrease in size, becoming more widely spaced and diffuse towards undertail-coverts and thighs.
Third-year	Male: upperparts and head dark brown; mantle pale reddish tawny admixed brown; throat brown and rest of underparts uniform brown suffused reddish; concealed pale marks on uppertail-coverts; tail washed white or greyish with bold narrow blackish undulating lines and broad subterminal black band, occasionally incomplete. Female: brick-red mantle, some feathers on upper mantle have dark centres and dark shafts on lower mantle; underparts similar to male but brick red.	Male: top and sides of head blackish brown, dorsal patch reddish tawny admixed brown; below whitish with underparts unmarked or with scant streaks on breast-sides; rest of underparts and thighs barred rusty-brown, stronger towards flanks, with finer and more widely spaced barring nearer tail. Tail as dark phase of same age but lacks greyish wash and has finer transverse black lines. Female: darker, with obvious brick red dorsal patch extending towards nape and from neck-sides towards flanks; underparts more barred.
Fourth-year	Male: wholly bluish grey to dark slate-grey with faint brown wash and slight reddish dorsal coloration admixed grey; reddish pectoral band. Female: darker slate-grey with rich, pure and intense brick red dorsal patch; below also brick red except throat, thighs and undertail-coverts.	Male: upperparts grey, with slight brownish tinge; top of head also grey and lower half white; brick red mantle; below white, finely barred dark chestnut to grey from mid breast to vent and thighs. Female: underparts as male, although somewhat more barred and has reddish-chestnut flanks and spots either side of breast.
Fifth-year	Male: entirely grey with scattered reddish-and-grey feathers on back and central chest. Female: darker, with grey bib from chin to mid breast; rest of plumage similar to fourth-year birds.	Male: similar to fourth-year birds, with small or poorly defined dorsal patch consisting of just a few reddish feathers; central vent and thighs with fine grey bars or vermiculations. Female: blackish-grey barring finer than in fourth-year; grey spots on breast-sides, and greyish flanks.
Sixth-year	Male: all grey with sometimes just a few vestigial red feathers on the mantle and, very occasionally, the breast. Female: essentially as previous year.	Male: as fifth-year but white below with grey vermiculations on thighs and flanks. Female: essentially as fifth-year.

pale dots; uppertail greyish or blackish grey, with closely spaced irregular brownish bars or extensive mottling.

Second-year: sexes alike. Like first-year but darker, from brownish to extremely dark sooty black. Incipient dimorphism usually detectable: males normally uniformly darker than females; markings restricted to median and greater upperwing- and uppertail-coverts; underparts in both sexes have scant pale spotting largely restricted to flanks; underwing almost lacks markings. Some show a pale wash on cheeks; tail greyer and with same pattern of dark barring as in previous plumage.

Third-year: sexes differ. **Male**: crown, head-sides, nape and hindneck blackish brown; crown and nape feathers have visible white bases; mantle reddish or reddish brown with some two-toned feathers having dark brown centres and reddish fringes forming a more or less consistent and homogeneous patch; rest of upperparts brownish black with concealed cinnamon-tawny scapular marks, and secondaries and primaries have dark barring on outer webs; outermost primaries have black tips, but inner primaries and secondaries may be fringed white distally; uppertail-coverts blackish with concealed pale spots; underparts reddish brown except throat, thighs, vent and undertail-coverts, which are uniform blackish brown; underwing-coverts also blackish with a few small dots; tail whitish, washed grey, especially on sides, with bold transversal black lines and a more or less complete broad subterminal black band; below a fine pale grey band and feathers finely fringed white distally. **Female**: usually like male but darker and reddish areas brighter; mantle uniform and brighter brick red, this colour sometimes extending from crown to scapulars and dorsal patch, and may also include neck-sides. **Remarks**: specimens in moult from second- to third-year show great individual variation in number of old brown feathers mixed with new reddish ones on dorsal patch and underparts. Aside of flight-feathers and tail, some females at this age and the next year can be extensively erythristic.

Fourth-year: sexes differ. **Male**: head and upperparts mid grey to uniform dark slate-grey, frequently with almost imperceptible brownish tones; nape feathers have visible white bases and black tips, forming conspicuous black-and-white nuchal spot; dorsal reddish patch consists of two-toned feathers, with grey centres and chestnut fringes, on hindneck and upper mantle; lesser and median upperwing-coverts uniform grey; greater coverts, secondaries and primaries grey with irregular close dark barring. Primaries and secondaries pale-tipped with blackish subterminal coloration visible in flight on upper and lower surfaces as a broad blackish distal band that follows outline of wing and remains evident in subsequent plumages; underparts uniform grey with a transversal reddish pectoral band; lesser and median underwing-coverts uniform pale grey, sparsely spotted; greater underwing-coverts pale greyish with black barring; tail as previous plumage but whiter and has a blacker, complete subterminal band. **Female**: upperparts dark slate-grey to slate-grey, similar to previous plumage, but has dorsal patch more intense and purer; underparts extensively reddish except throat, neck, thighs and belly, which are uniform slate-grey. Undertail-coverts, wing and tail as male and remain as such in subsequent plumages.

Fifth-year: sexes differ. **Male**: as previous plumage but greyer, lacking brownish tones, ground colour varying from lead or blue-grey to uniform blackish slate; the few grey-and-red feathers in upper mantle not forming a defined patch; rump blackish and upper- and undertail-coverts have white distal fringes; underparts uniform grey with scattered reddish feathers that may or may not form a defined transversal upper breast-band; lesser and median underwing-coverts with scant pale grey spotting and same barring as on greater underwing-coverts. **Female**: upperparts similar to fourth-year plumage but with a shorter, reddish dorsal patch from base of hindneck to mantle or mid scapulars; underparts have a uniform grey bib, paler on throat; below, a broad uniform red band restricted to mid breast; flanks with mixed grey and reddish tones; belly, thighs and undertail-coverts same blackish-grey colour.

Older than five years: sexes differ. **Male**: appears all uniform grey, sometimes with a few grey-and-red feathers on mantle and, more rarely, in mid chest, which are lost in subsequent years, although some persist in oldest live birds. **Female**: grey areas darker than in male in all plumages. Red-and-grey pattern similar to fifth-year with no obvious changes. **Remarks**: Exceptionally, an adult female from Colchagua (Cordillera, Chile, BMNH 1844.44.10.7.1) did not have thighs and lower chest uniform grey, as is usual in *B. polyosoma*, but instead showed faint, fine and well-spaced whitish bars over steel grey on belly and thighs, typical of definitive plumage of dark-morph *B. poecilochrous* (Gurney 1879, Cabot & de Vries unpubl.). This unusual bird has subsequently been reidentified (twice as *B. polyosoma* and once as *B. poecilochrous*) and was discussed by experienced taxonomists such as Hellmayr (1932) and Vaurie (1962). Farquhar (1998) also found, amongst the specimens he examined, a male dark-morph *B. polyosoma* with barred rear underparts.

Pale morph

First-year: sexes alike. Upperparts dark brown; feathers on crown, nape and hindneck pale-bordered, affording streaked appearance, with white feather bases to crown and nape (visible on latter); mantle usually more uniform or feathers have pale fringes; upperwing-covert and scapular feathers have pale fringes coarsely marked with ochraceous yellowish to tawny cinnamon; rump brown with ochre or tawny spots; uppertail-coverts white with cinnamon-coloured marks; secondaries and primaries browner than dark morph; supercilium and cheeks pale cream to rusty, frequently with short, fine dark streaks; malar stripe dark brown; underparts creamy to ochraceous; some fine dark streaks on chin; feathers on neck-sides and upper breast have some dark shaft-streaks and a tear-shaped base, central parts more uniform; mid and rear underparts clearly delimited by dense V-shaped rusty to rufous or mahogany marks, browner on sides of mid underparts, which radiate, decrease in size and become less pointed on rear underparts and thighs; a few small dark marks on undertail-coverts; underwing-coverts beige with dark markings. Uppertail grey-brown, paler, but with same barred pattern as first-year dark morph.

Second-year: sexes alike, as preceding plumage. Upperparts similar, with profuse pale marks and feathers on dorsum broadly fringed pale ochre to cinnamon, especially on mantle-sides, where markings apparently more rufous or cinnamon in females; in some, median and lesser upperwing-coverts and scapulars are extensively marked tawny cinnamon or admixed brown; rump brown with ochre or tawny spots and uppertail-coverts cinnamon; throat faintly whitish, but underparts similarly or less marked; mid and rear underparts reticulated or have coarse rusty to ferruginous bars; markings diminish towards tail and merge into barring on thighs and vent; slight barring on undertail-coverts. Uppertail more greyish, but sometimes washed cinnamon and has same markings, the ultimate dark bar distally more obvious and slightly broader.

Third-year: sexes differ. **Male**: head, nape and sides dark brown or blackish, crown and nape feathers with white bases (visible on latter), and rest of upperparts brown-grey, with a pale chestnut patch on mantle sometimes extending onto scapulars; occasionally reddish feathers with dark centres, usually on upper mantle, with dark lines along shafts on lower mantle; upperwing-coverts and scapulars have markings as in rest of previous plumage; rump brown with ochre marks and uppertail-coverts cinnamon; underparts whitish with unmarked, uniform bib, or some dark lines on sides; mid and rear underparts have rusty-orange to brown-mahogany barring, tending to ferruginous, which decreases in size and in intensity near tail; thighs similarly barred. Tail white with broad black subterminal band bordered below by a narrow greyish band; distally bordered white with fine, well-spaced black transversal lines above, varying in number. Underwing-coverts whitish with some dark markings. **Female**: crown blackish brown with darker back; mantle with intense brick-red patch, which in some reaches from nape to scapulars; also extends to neck-sides, forming reddish patch either side of bib, extending to flanks and underwings, which appear reddish or cinnamon-tinged, admixed grey; rest of underparts similar to male, although more ferruginous and more heavily marked.

Fourth-year: sexes differ. **Male**: similar to preceding plumage; upperparts grey, from silvery to bluish lead grey without brownish tone; visible white bases to feathers on nape; dorsal patch more intense brick red. In some, patch restricted to

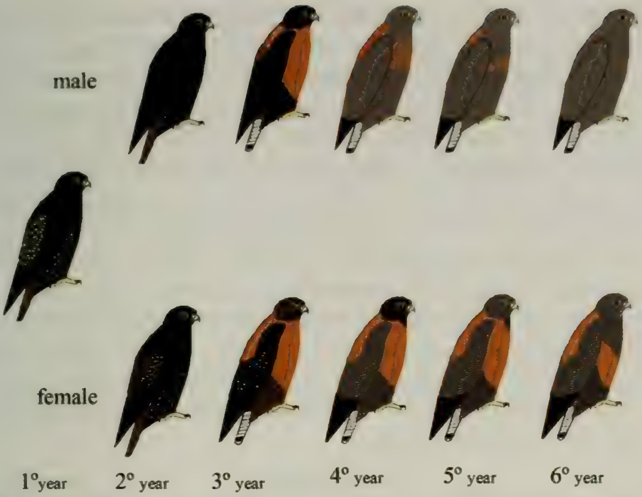
male
female
1° year
2° year
3° year
4° year
5° year
6° year

Figure 1. Dark-phase plumage patterns in *B. polyosoma* according to age and sex. Numbers correspond to calendar year.

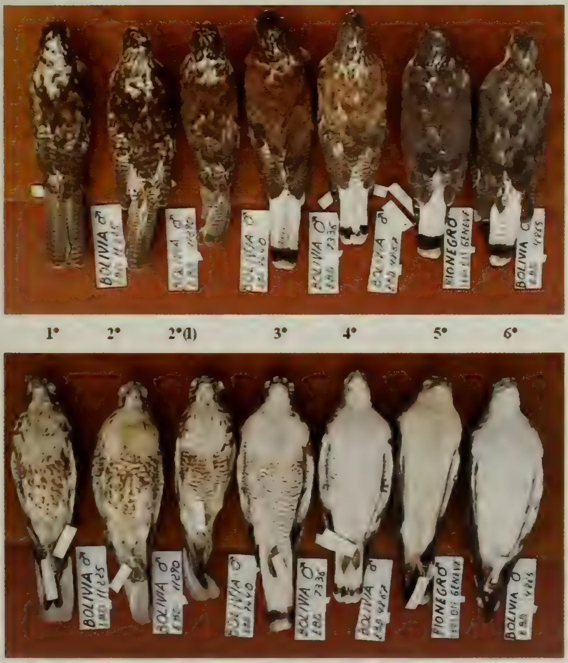
1°
2°
2°(l)
3°
4°
5°
6°
BOLIVIA ♂
RIONEGRO

Figure. 2. *B. polyosoma* pale-phase male plumage patterns according to age. Numbers correspond to calendar year. (l) = late.

mantle, but in others extends to scapulars. Patch also varies from almost uniformly reddish to grey due to number of red-and-grey feathers; upperwing as dark morph, although paler; rump dark grey or brownish grey, and uppertail-coverts whitish with grey barring; underparts generally white, with grey or blackish-grey barring and becoming finer and less perceptible ventrally; undertail-coverts almost uniform white with few dark markings; lesser and median underwing-coverts whitish, almost lacking markings, and greater coverts pale grey with dark barring; tail as preceding plumage, although whiter with subterminal band blacker and transversal lines finer and better defined. **Female**: upperparts darker with a black crown in some; dorsal patch uniform; more extensive, intense brick-red mantle, with dark streaks on upper mantle, extending to form reddish-grey spots either side of chest; in some red dorsal patch can extend from scapulars to mid crown; rump darker slate-grey and uppertail-coverts whitish with grey to black barring. Underparts like male but with blacker and slightly broader barring; sides have black to grey barring with chestnut- or rusty-toned markings.

Fifth-year: sexes differ. **Male**: essentially similar to previous plumages but upperparts paler grey with visible dark shafts; feathers on nape have white bases and black tips forming a visible patch; small red patch restricted to upper mantle or a few irregularly distributed red-and-grey feathers; underparts with grey markings either side of bib; mid and rear underparts and thighs with transverse dark lines or, sometimes, almost imperceptible vermiculations, becoming more obvious on lower breast-sides; flanks have transverse lines and grey markings; lesser and median underwing-coverts purer white, greater underwing-coverts white to greyish with blackish barring. **Female**: dorsal plumage similar to previous year; less barred on underparts; flanks with grey markings and barring as male.

Older than five years: sexes differ. **Male**: upperparts totally grey or with scattered red-and-grey feathers on mantle; underparts tend to be more uniform with age and gradually lose transverse lines on chest and thighs, although faint vermiculations almost always detectable. **Female**: little change, except a gradual loss in intensity and width of transverse lines on underparts, which are always more obvious in males.

Remarks: in both dark and pale morphs, some have a white or ochraceous forehead, or a spot either side of bill base. To a greater or lesser degree, some have secondaries and tips of innermost primaries with a white or whitish fringe. Some juveniles of both morphs have uniformly blackish tips to outermost primaries, whilst others exhibit some pale spotting on inner webs or spots on inner and outer webs that form contrasting pale brown barring.

The sequences of age-related plumage changes, from juvenile to definitive adult, in both sexes are summarised in Fig. 1.

Relationship between the morphs

Pale birds predominated (86.1%; n=129) over dark in our sample; only four dark-phase birds (two from Tucumán, Argentina, one from Colchagua, Chile, two from La Paz, Bolivia) are known away from southernmost South America (in European collections none was found from Colombia, Ecuador or Peru); all other dark specimens (82.4%; n=25) are from southern Argentina and Chile. This approximates to the percentages found by de Vries (1973) (82.7 %, n=75) and by Vaurie (1962) (90%, n=242) for pale birds.

Field observations reveal a much greater proportion of pale birds. Bellati (pers. comm.) recorded only six dark birds (1.2%) of a total of 490 observed in non-Andean Patagonia (Bellati 2000). Donázar *et al.* (1993) found only pale birds in Patagonia, as did JC in Andean Bolivia during a five-year study. Furthermore, all 13 live birds studied from Peru were pale morphs, as were six observed in March 2003 in Andean Ecuador.

Discussion

Morphs, delayed plumage maturation and plumage change

All plumage types of all birds examined can be classed as belonging to either pale or dark morphs. Such coloration is not uncommon in Buteo (Brown & Amadon 1968) and has been recognised in B. polyosoma (Reynolds 1935, Housse 1945, Woods 1988). The rufous morph suggested by Goodall et al. (1951) and Johnson (1965) on the basis of dark-morph specimens with extensively chestnut body plumage does not exist.

Pale-phase birds—also referred to as 'normal-phase' birds (Jiménez 1995)—are more abundant, both in the wild and in museums. Dark birds are rare over much of the species' distribution. The relatively numerousness of dark-morph birds in collections is explained by the large number of specimens in the Natural History Museum (Tring), in which the Falklands and the southern tip of South America—where dark birds are commoner (Reynolds 1935, Woods 1988)—are particularly well represented. Other European museums have a majority of birds from Argentina and Chile, i.e. the region where a large percentage of southern birds winter. Another factor is the possible bias shown by collectors towards rarer dark birds, as a means of equalling numbers in a series of both colour morphs.

Age- and sex-related plumage changes in pale birds were briefly mentioned by Reynolds (1935) and subsequently described by Housse (1945) and Goodall *et al.* (1951), who calculated 3–5 years as the time needed to reach definitive plumages. Our results and those of Pávez (1998) have established a period of six years. This is long considering the size and weight (*c.*1 kg: Cabot 1991, Jiménez 1995) of the species.

Delayed maturation only occurs in the phylogenetically closest species that constitute the oldest cluster within *Buteo* (Riesing *et al.* 2003). Along with *B. polyosoma*, these species are: *B. poecilochrous* (Cabot & de Vries unpubl.), *B. albicaudatus* (Lehmann 1945, Torres Barreto 1986) and *B. melanoleucus*. Papers on plumage change in *B. polyosoma* published in Spanish have been all but ignored, unlike publications in English by European and North American authors based on analyses of incomplete series' of skins that do not provide evidence for the existence of sequential plumage variation. Thus, Vaurie (1962), Brown & Amadon (1968) and Farquhar (1998) discussed plumage, age and sexual dimorphism in *B. polyosoma* without being aware of its sequential pattern of plumage change.

This process of plumage change concludes with a sexually dimorphic terminal plumage, somewhat unusual in *Buteo*. Prior to this, subadult males pass through a stage in which they acquire coloration and patterns resembling the final female plumage of their respective phases. Acquisition of adult female markings by subadult males also occurs in *B. poecilochrous*, a polyandrous species in which up to four males may cooperate in chick-raising (Solís & Black 1985, Coello 1997). However, no cases of polyandry have been recorded for *B. polyosoma* anywhere in its vast range (Jiménez 1995).

The following features stand out in this process of delayed maturation. Both morphs coincide in the following: retention of juvenile characteristics during the first two years of life, with incipient sexual dimorphism occurring in the second year onwards; and immature males (third and fourth years) imitate definitive adult female plumage of their respective morphs. Conversely, female erythrism reaches its peak at this age, as if female plumage always tends to differ from that of males. Fifth-year or older birds show marked sexual dimorphism (unusual in this genus): thus, males lose their female characteristics whilst females retain plumage patterns similar to subadults.

Fifth-year Chilean males show similar reddish dorsal coloration to females (Pávez 1998). We have observed southern males—presumably of this age group—with uniform white underparts and extensive reddish dorsal areas. Nevertheless, throughout the rest of the species' range birds of this age tend to have less reddish dorsal coloration and in live, fourth-year Peruvian males the reddish dorsal area is relatively small. This seems to indicate that the process of delayed maturation varies between geographically distinct populations. Such variations can be linked to obvious differences in size, given the direct relationship between longevity and body size. The largest birds occur in the southernmost part of the species' range, and the smallest in coastal Peru and Ecuador (de Vries 1973, Fjeldså & Krabbe 1990, Cabot & de Vries 2003).

The two morphs differ in regard to sexual dimorphism in body plumage. Pale-phase birds of both sexes have virtually identical underparts but different dorsal plumages, whilst dark-phase birds maintain differences in upperparts and underparts.

Vaurie (1962) and de Vries (1973) assumed that birds with white tails (and a black subterminal band) were sexually adult, although, as we have seen, this characteristic is reached as early as the third year. Reynolds (1935), who claimed to have climbed to hundreds of nests, mentioned that it is not unusual to find breeding pairs in which one bird still has the brownish coloration mixed with white or red of the following plumage stage. This indicates that sexual maturation is not delayed until the sixth year. Mate selection remains mysterious, and we should note that it is surprising that white-tailed males (3–5 years old) should moult through an incomplete, dullish reddish-brown female plumage, and that in these same age-classes females should become very prominent in their brilliant reddish-brown colours.

Vaurie's phases

Vaurie (1962) established five adult plumage types, four of which coincide with those described here. Types B and D of Vaurie's classification correspond to definitive adult male and female pale-morph plumages respectively (Pávez 1998), whilst types C and A coincide with definitive dark-morph male and female plumages (over five years old). Vaurie (1962) was correct in establishing these categories in his heterogeneous sample, despite the existence of delayed maturation with several successive age-classes appearing before a definite plumage phase had been recognised. Likewise, no accurate criteria existed then for separating *B. polyosoma* from *B. poecilochrous* in the hand. This we see in Vaurie's type E (birds with reddish backs and breasts, and reddish and grey-barred with white rear underparts and thighs). Vaurie's type E does not correspond to any plumage phase in *B. polyosoma*, rather it represents a dark-phase *B. poecilochrous* female prior to the acquisition of definitive plumage. In its final adult plumage *B. poecilochrous* loses the transverse chestnut pectoral band and retains the white-grey or whitish black, strongly barred, mid and rear underparts and tibial feathers (Gurney 1879, Lehmann 1945, Johnson 1965). Such confusion between *B. polyosoma* (uniform underparts) and *B. poecilochrous* (strongly barred) is also obvious in Fig. 196, Plate 62 of Ferguson-Lees & Christie (2001). The final characteristic plumage of a dark-phase adult female is shown in Fig. 184, Plate 18 (Thiollay 1994), although the uniform grey bib and rear underparts are less extensive than in real life.

Brown-headed specimens in Vaurie's type A represent subadult dark-phase females, 3–4 years old, which will eventually moult to a grey head and bib, uniform grey and unbarred rear underparts, with a transverse chestnut pectoral band, but this is not definitive plumage.

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Recent observations of Dull-coloured Grassquit *Tiaris obscura* in Mato Grosso reinforce its status as an austral migrant to south-west Brazil

by Andrew Whittaker & Braulio Carlos

Received 25 September 2003

On 16 September 2000, at Coxipó de Ouro, Cuiabá, Mato Grosso, whilst leading a bird tour, AW heard an unknown call in response to his imitation of Ferruginous Pygmy-owl *Glaucidium brasilianum*. Tracking this call to some low, dry thorny scrub bordering taller gallery forest, he located two unfamiliar dull-coloured Fringillidae. AW recommenced the owl imitations and the birds approached even closer, permitting excellent views at 5–6 m through 10 x 42 binoculars in perfect light. The following field marks were noted: two small *c*.10.5–11.0 cm nondescript dull seedeaters, olive-brown above with a slightly paler buffy eye-ring and one had slightly richer brownish fringes to the greater wing-coverts. The only distinctive feature shown by both birds was the short, stubby bicoloured bill, with pale yellowish lower mandible contrasting with a darker dusky upper mandible. Underparts were a dirty off-white sandy coloration, paler than the browner upperparts. The general nondescript plumage combined with the distinctive bicoloured bill confirmed that they were *Tiaris obscura*. AW recognised the significance of this record, but as the birds were silent and he lacked photographic equipment, documentation was impossible. The two *Tiaris obscura* loosely associated with two Red Pileated-finches *Coryphospingus cucullatus*, which had also approached closely in response to the owl imitation.

AW shared this exciting record with BC, alerting him to the possible presence of the species in the northern Pantanal during the austral winter. On 8 March 2002, near Poconé, Mato Grosso, in open grassland along the Transpantaneira highway leading into the northern Pantanal (16°19'S, 56°38'W), BC heard an unknown vocalisation that reminded him of the cut of *T. obscura* on Mayer (2000). In response to playback of this recording, a single *T. obscura* immediately approached to within 2 m, remaining very agitated, but silent. Thus, again, audio recordings could not be obtained to authenticate the record. BC noted the bicoloured bill as extremely evident, yellowish below with a dark dusky maxilla, and that the bird had an indistinct buff eye-ring. Following playback of *G. brasilianum* the only other seedeater to approach was an immature male Dark-throated Seedeater *Sporophila ruficollis*. Again, on 16 October 2002, at Chapada dos Guimarães, Mato Grosso, BC observed 2–3 *T. obscura* at the transition between gallery forest and shorter dry scrub. All were easily distinguished by their distinct bicoloured bills. They remained silent and were in a monotypic flock, without any other seedeaters.

Bates (1997) drew attention to two overlooked historic *T. obscura* specimens housed in the American Natural History Museum (AMNH), collected by H. H. Smith at Chapada, Mato Grosso, Brazil, on 29 July and 30 August 1885. These two (AMNH 32582 and 32588) had been overlooked for over a century, having been misidentified as female Sooty Grassquits *Tiaris fuliginosa* (e.g. Allen 1891, Naumburg 1930, Hellmayr 1938). They are the first Brazilian specimens of *T. obscura*. Bates (1997) suggested they are *T. o. obscura*, which breeds in Paraguay and Argentina, and is a regular visitor during the austral winter to the eastern lowlands of Bolivia, Paraguay and northern Argentina. Bates (1997) went on to state that these records represent non-breeding extralimitals and that additional information is required to determine the status of the species in the region.

Our recent field observations reinforce the impression that *T. o. obscura* is an austral migrant to south-west Brazil, which due to its cryptic similarity in the field to several species of female seedeaters *Sporophila* sp. and female grassquits *Tiaris* sp. has most probably been long overlooked. We hope our report will alert observers to pay critical attention to female-type *Sporophila* and *Tiaris*, particularly during the austral winter, and permit them to key into *T. obscura*. We recommend detailed field searches for *T. obscura* in south-west Brazil during the austral winter to clarify its range and status in Brazil.

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A specimen of Cape Petrel *Daption capense* from north-east Brazil

by Caio José Carlos, Jeremiah Trimble & Carmem Elisa Fedrizzi

Received 8 October 2003

Cape Petrel *Daption capense* is a mid-sized procellariiform which breeds on subantarctic islands throughout the Southern Ocean, and the Antarctic Peninsula and continent (Harrison 1983, del Hoyo *et al.* 1992). On dispersal, which commences February–March, it regularly occurs north to *c.*25°S, and has reached Ecuador and Colombia, and even Mexico and northern California; in the Atlantic, it reaches Uruguay and Brazil, north to Rio de Janeiro (Harrison 1983, Sick 1997).

As part of ongoing research on seabirds off north-east Brazil, we located an old, and apparently overlooked, specimen of the species at the Museum of Comparative Zoology (MCZ), Harvard University, Cambridge, Massachusetts. The bird (MCZ 226730, adult, sex unknown) was collected by George H. Mackay at Cabo de São Roque (05°29'S, 35°16'W), on the coast of Rio Grande do Norte, near the mouth of the Maxaranguape River (Paynter & Traylor 1991), on 9 June 1863. This record extends the species' range north more than 2,000 km in the western Atlantic (Blake 1977, Pinto 1978, Harrison 1983, Sick 1997, Vooren & Brusque 1999).

Measurements (mm) of the skin are: culmen 33; wing 262; tail 99 and tarsus 44. Plumage: upperparts with black mantle merging into white back and rump, both broadly marked with black chevrons recalling a checkerboard; wings mostly black; and tail mostly black with white base. Given the plumage and morphometrics, the specimen is of nominate *D. c. capense*, which breeds on subantarctic islands in the western hemisphere (e.g. South Georgia and the South Shetlands), the Antarctic Peninsula and continent (Harrison 1983, del Hoyo *et al.* 1992). The other subspecies, *D. c. australe* breeds at the Snares, Antipodes, Bounty and Campbell islands, off New Zealand, and is smaller and has more white on the upperparts (Harrison 1983). For a comparison of the plumages of these taxa see Fig. 1.

How could a southern polar procellariiform reach the warm waters of north-east Brazil? During the austral winter, many birds from the Southern Ocean undertake regular northward movements along the Brazilian coast to *c*.22°S, mainly occurring at rich upwelling areas like those of the Cabo Frio region, Rio de Janeiro, or high-productivity areas in south and central São Paulo (Olmos *et al.* 1995, Sick 1997). More rarely, some reach waters off north-east and north Brazil. For instance, White-chinned Petrel *Procellaria aequinoctialis* and Atlantic Petrel *Pterodroma incerta* have been recorded at the mouth of the Amazon (Novaes 1959, Teixeira *et al.* 1996), Light-mantled Sooty Albatross *Phoebetria palpebrata* in coastal Bahia (Sampaio & Castro 1998), and Snowy Sheathbill *Chionis albus* in Pernambuco (Telino Júnior *et al.* 2001). Strong winds associated with cold fronts originating in

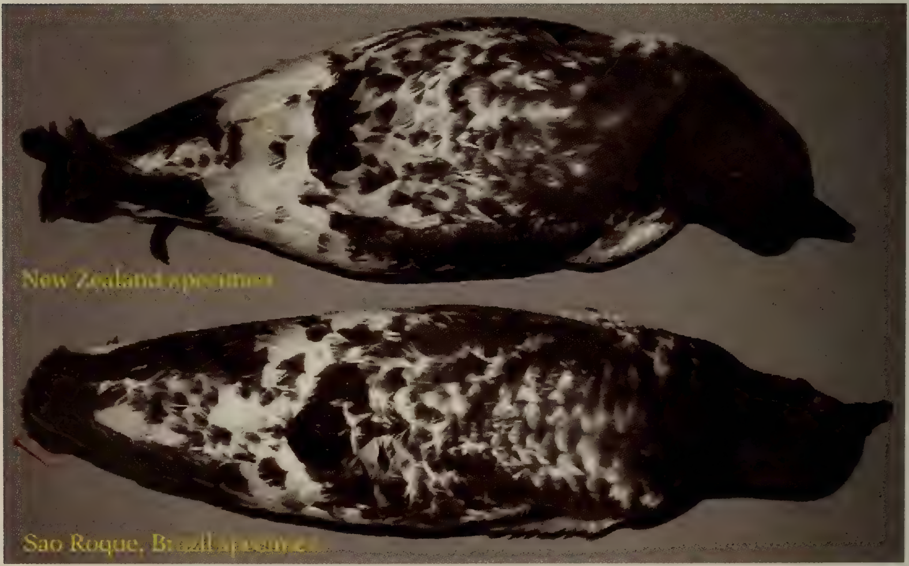

Figure 1. Cape Petrel *Daption capense capense* specimen from Cabo de São Roque (MCZ 226730), Rio Grande do Norte, Brazil, and a specimen of *D. c. australe* from the Snares Islands, New Zealand (MCZ 300895) (Jeremiah Trimble)

Antarctica may be important in explaining the apparently anomalous occurrence of such birds north to the equator.

The appearance of Southern Ocean birds in north-east Brazil, a region dominated by sandy beach coasts where the sea is generally nutrient-poor, may be linked to the high outflow of nutrients from such mainland ecosystems as large estuaries and associated mangrove swamps, e.g. in the Canal de Santa Cruz estuarine complex, Pernambuco, and the mouth of the São Francisco River, Alagoas (Azevedo Júnior 1998, Souza 1993). Thus, the region of Cabo de São Roque, which is only *c*.3 km north of the mouth of the Maxaranguape River, may constitute a relatively productive area, permitting the occurrence of subantarctic birds such as Cape Petrel and Southern Fulmar *Fulmarus glacialoides*, the latter confirmed by three skins at MCZ (186306, 186307, 226729, all taken, on 9 June 1863, at Cabo de São Roque, and collected by George H. Mackay).

Finally, it must be stressed that there are few studies on the distribution of seabirds off north-east Brazil. Antas (1991) noted that ornithologists interested in seabirds are mainly resident in southern Brazil. Future surveys will probably reveal that southern migrants are more common in the region than previously supposed.

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***Motacilla samveasnae* is the correct scientific name for the Mekong Wagtail**

by J. W. Duckworth & Per Alström

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The Mekong Wagtail *Motacilla samveasnae* was described recently (Duckworth *et al.* 2001). The spelling of its name was questioned by van Rootselaar (2002), who stated that 'Following the nomenclatural rules of the International Commission on Zoological Nomenclature...and considering that the species' name was 'formed directly from a modern personal name' and that 'the name is to be formed by adding to the stem of that name -i if the personal name is that of a man', the Mekong Wagtail's scientific name should perhaps be cited as '*Motacilla samveasnai* Duckworth *et al.* 2001', instead of *Motacilla samveasnae*'. This proposal is not correct, and would lead to confusion if adopted.

The *International code of zoological nomenclature*, fourth edn (International Commission on Zoological Nomenclature 1999) governs the formation and usage of all names proposed on or after 1 January 2000. Article 31.1.1 states that 'A species group name, if a noun in the genitive case formed from a personal name that is Latin, or from a modern personal name that is or has been Latinized, is to be formed in accordance with the rules of Latin grammar'. Article 31.1.2 states that 'A species group name, if a noun in the genitive case...formed directly from a modern personal name, is to be formed by adding to the stem of that name *-i* if the personal name is that of a man,... *-ae* if of a woman...'. Those proposing names are at liberty whether to follow article 31.1.1 or 31.1.2. The bird is named after Sam Veasna, a man (Poole 2000), and therefore under article 31.1.2 it would take the form '*samveasnai*', as suggested by van Rootselaar. However, the masculine genitive singular ending *-ai* may not have existed in Classical Latin (if it did, it was very rare), the genitive singular of Latin nouns (of either gender) ending in -a typically being -ae (e.g. *agricola, -ae*, masculine, a farmer). Proposing the name under article 31.1.1 avoids the awkward '*ai*' ending. As a personal name 'samveasna' is a noun. In treating its genitive as 'samveasnae' it was Latinized in accordance with the rules of Latin grammar. The present example is thus analogous to that presented under article 31.1.1, whereby a man's name, 'Poda', is also used directly, and given the genitive form of '*podae*'. This style has typically been used for species-group names where the man's name ends in *-a*, e.g. *Turdus feae* and *Muntiacus feae*, both named after Leonardo Fea, the (male) Italian ornithologist and collector.

The code makes it clear that the spelling '*samveasnae*' should be retained unchanged. Article 32.1 defines 'the 'original spelling' of a name as the spelling used in the work in which the name was established' (in this case, Duckworth *et al.* (2001), who used '*samveasnae*'). Article 32.2 states that 'the original spelling of a name is the 'correct original spelling', unless it is demonstrably incorrect as provided in Article 32.5'. Article 32.5 defines incorrect original spellings. Article 32.5.2 deals with presentational issues (diacritics, ligatures, apostrophes, hyphens etc.) and article 32.5.3 refers only to family-group names. The only part of article 32.5 relevant to *Motacilla samveasnae* is article 32.5.1, which states, 'if there is in the original publication itself, without recourse to any external source of information, clear evidence of an inadvertent error...it must be corrected.' Nowhere in Duckworth *et al.* (2001) did we state or imply that article 31.1.2 was used in forming the name (this was an assumption by van Rootselaar), nor did we state that Sam Veasna was a man. Thus, there are no grounds for considering '*samveasnae*' an incorrect original spelling as defined by the code.

Article 32.3 specifies that 'the correct original spelling of a name is to be preserved unaltered, except where it is mandatory to change the suffix or the gender ending under Article 34'. No provision of article 34 is relevant to this case: all deal with 'mandatory changes in spelling consequent upon changes in rank or combination'.

Hence, no article in the code supports van Rootselaar's statement that the original spelling should be changed. Because this is a complex issue, the code provides specific guidance through article 31.1.3: 'The original spelling of a name formed under Articles 31.1.1 and ... [see above] is to be preserved unless it is incorrect [Arts. 32.3, 32.4]' (see above).

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The above contribution raises an interesting issue, of which future contributors of papers describing new taxa, or proposing new names for existing taxa, need to be mindful. Both the etymologies of English and scientific names, and their derivations, should be clearly explained in all such cases. In the present instance, the authors of the new wagtail, *Motacilla samveasnae*, have successfully demonstrated that their original name was correct, but a clear explanation of the derivation of their suffix in the original publication would have avoided the need for such clarification.—The Editor.

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CORRECTIONS TO TEXT

Page	1	Line	23	*Bull. Brit. Orn. Cl.* 123 (2) not 122 (3)
"	4	"	22	*diomedea* not *diomedia*
"	16	"	11	*tristriatus* not *trisiatus*
"	19	"	1	*Lophophorus* not *Lophophorous*
"	32	"	15	*aurantiaca* not *aurantiacus*
"	34	"	15	*polychopterus* not *polycopterus*
"	41	"	16	*melanoleucus* not *melanoleucos*
"	44	"	12	*cayennensis* not *cayenensis*
"	48	"	1	*Chlorostilbon* not *Chlorstilbon*
"	62	"	11	*leucaspis* not *leucapsis*
"	141	"	48	*warszewiczi* not *warscewiczi*
"	142	"	23	*nigriceps* not *nigrifrons*
"	142	"	30	*Cyanolyca* not *Cyanocorax*
"	225	"	17	*Taeniotriccus* not *Taenotriceus*

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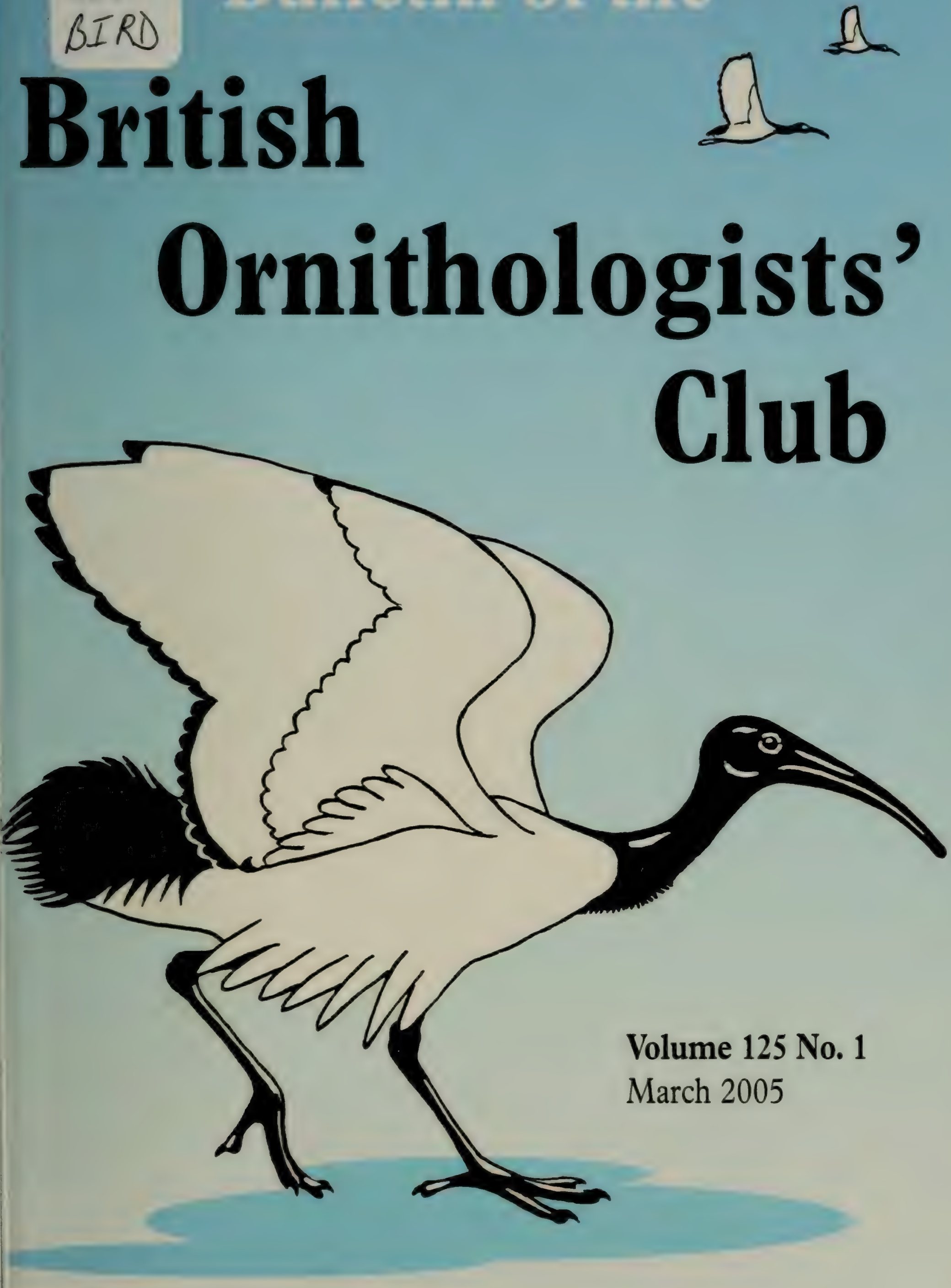

Volume 125 No. 1
March 2005

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. (Limited car parking facilities can be reserved [at a special reduced charge of **£5.00**], on prior application to the Hon. Secretary.)

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm**. (A vegetarian menu can be arranged if ordered at the time of booking.) Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges are **£20.00** as from **1 January 2005**.

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

15 March 2005 (please note change of date)—Dr D. H. (David) Thomas—The shady life of birds
David Thomas, Senior Lecturer in Zoology at the University of Wales, has specialised in the behavioural and physiological adaptations of birds in extreme environments, especially deserts—research on sandgrouse and phasianids in Moroccan Sahara, Negev, Namib and Sonoran Deserts as well as marine habitats—research on penguins in southern Africa and on shearwaters in the UK.

*Applications to Hon. Secretary (address below) by **1 March** please.*

26 April 2005—ANNUAL GENERAL MEETING at 6pm, followed by **Club Social Evening**. There will be no speaker, but Members are invited to bring along one or two slides (or a specimen!) of a bird of topical interest, and to speak **for not more than 5–10 minutes** about it. The aim will be to generate discussion and to facilitate the exchange of information between members.

*Applications to Hon. Secretary (address below) by **12 April** please, including subjects to be raised and any special facilities required.*

7 June 2005—Dr Joanne Cooper—A Tomb Wader exposed: x-raying the birds of the gods
From a background in geography and geology (but with a long-term interest in birds), Jo studied the Late Pleistocene avifaunas of Gibraltar for her PhD in the Bird Group of The Natural History Museum. During this time she also began working with the Museum's collection of ancient Egyptian bird mummies, using her experience of avian osteology to identify and analyse the specimens. Her work at the Bird Group was then interrupted by spending a year in New Zealand pursuing her interests in the fossil birds of the Chatham Islands. Returning to the UK in 2001, she went back to the NHM, where she now works as one of the Bird Group's curators. Following a surge of interest in the NHM's animal mummies, she has recently re-opened her files on the mummies and is actively researching them once again.

*Applications to Hon. Secretary (address below) by **24 May** please.*

27 September 2005—Dr Colin Ryall—The House Crow
Details to follow.

*Applications to Hon. Hon. Secretary (address below) by **13 September** please*

Future meetings in 2005—dates for further meetings in 2005 have been set for the following Tuesdays: 1 November and 6 December. **Speakers to be announced**.

Overseas Members visiting Britain are especially welcome at these meetings, and the Hon. Secretary would be very pleased to hear from anyone who can offer to talk to the Club, in 2005, giving as much advance notice as possible—please contact: Tony Statham, Woodcock Hill, Durrants Lane, Berkhamsted, Herts. HP4 3TR, UK (or e-mail: SAHS@tinyonline.co.uk).

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CLUB ANNOUNCEMENTS

2005 subscription renewals. These were due on 1 January. At the time of going to press (2 February), many subscription renewals were still outstanding; including a high proportion of 'underpayments' of Bankers Standing Orders (BSOs) which have not been amended to the increased rates for 2005. If action has not already been taken, please send the correct remittance to the Membership Secretary (mbcasement@aol.com) as soon as possible. Despatch of the June issue 125 (2) will be delayed for those who have not paid in full by 1 June.

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club will be held in the Sherfield Building, Imperial College, London SW7 at 6.00pm on Tuesday 26 April 2005.

AGENDA

1. Minutes of the 2004 Annual General Meeting (see *Bull. Brit. Orn. Cl.* 124: 74–76).
2. Chairman's report.
3. Trustees Annual Report and Accounts for 2004 (both to be distributed at the meeting).
4. The *Bulletin*. Editor's report.
5. Publications report—Revd. T. W. Gladwin, Chairman JPC.
6. The election of Officers. The Committee proposes that:
    - (i) Cdr. M. B. Casement, OBE, RN, be elected *Chairman* (*vice* Dr C. F. Mann) and to continue (*ex-officio*) as *Hon. Membership Secretary*.
    - (ii) Mr S. A. H. Statham be re-elected as *Hon. Secretary*.
    - (iii) Mr D. J. Montier be re-elected as *Hon. Treasurer*.
    - (iv) Three appointments to committee be made (*vice* Prof. R. A. Cheke, Mrs M. N. Muller and Dr P. G. W. Salaman) from the following five nominations: Miss H. Baker, Dr J. Cooper, Mr D. J. Fisher, Mr S. W. Lowe and Mr P. J. Wilkinson.

    Note: no appointment has yet been proposed for Vice-Chairman.
    Ex-officio members (in continuation): Revd. T. W. Gladwin (*Chairman Joint Publications Committee*), Prof. R. A. Cheke (*Hon. Publications Officer*), Dr P. G. W. Salaman (*Hon. Website Manager*) and G. M. Kirwan (*Hon. Editor*)
7. Any other business of which advance notice has been given.

The 924th meeting of the Club was held on Tuesday 22 June 2004, in the Sherfield Building Annexe, Imperial College, London. 16 Members and 4 guests were present.

Members attending were: Dr C. F. MANN (*Chairman*), Miss H. BAKER, I. R. BISHOP, D. R. CALDER, F. M. GAUNTLETT, D. GRIFFIN, C. A. R. HELM, G. P. JACKSON, R. H. KETTLE, R. R. LANGLEY, Dr P. J. K. McGOWAN (*Speaker*), D. J. MONTIER, N. J. REDMAN, S. A. H. STATHAM, R. P. TIPPER and R. P. WEBSTER.

Guests attending were: Ms G. BONHAM, Mrs J. CALDER, Mrs M. H. GAUNTLETT and Mrs M. MONTIER.

After dinner, Dr Phil McGowan, Conservation Director of the World Pheasant Association, gave a talk on *Threatened pheasants and partridges in Asia*. The following is a brief synopsis.

Pheasants and their relatives have had a long association with man, being important in culture as well as for sport and food. The order (Galliformes) to which they belong has a worldwide distribution with high concentrations of species in Asia and South America. These are also regions where most threatened species occur and also where food is in short supply for human societies. It is believed that hunting for one reason or another makes these birds more at risk of extinction than most other orders of birds. In eastern Asia there are about 105 species of pheasant and partridge with all but a handful being endemic. Of these, 33 are considered threatened and a further 16 near threatened. The most threatened is Himalayan Quail *Ophrysia superciliosa*, which may be extinct, as it has not been recorded for more than 100 years despite several searches, although none has been very thorough. Other highly threatened species include Sichuan Hill-partridge *Arborophila rufipectus*, Orange-necked Hill-partridge *A. davidi*, Edwards' Pheasant *Lophura* (*edwardsi*) *edwardsi* and Bornean Peacock-pheasant *Polyplectron schleiermacheri*, a rather enigmatic species that is rarely reported. A considerable amount of work has been undertaken on these species over the last 25 years and this has greatly enhanced our knowledge of their distribution, status and conservation requirements. For example, the once-extensive distribution of Swamp Francolin *Francolinus gularis* in India and Nepal is now restricted to isolated patches of wet grassland and agriculture, and if a mosaic of these habitats can be maintained, along with a few key protected areas, then its survival prospects are good. Also, a key issue for the Western Tragopan *Tragopan melanocephalus* in the western Himalayas is likely to be hunting pressure in the winter when snow forces the species downslope and close to villages. Solutions to these issues are now being developed and include community programmes (such as support for schools in Seti Khola, west-central Nepal) and strict protection where necessary, such as in southern Sichuan.

The 927th meeting of the Club was held on Tuesday 7 December 2004, in the Sherfield Building Annexe, Imperial College, London. 19 Members and 4 guests were present.

Members attending were: Cdr. M. B. CASEMENT RN (*Acting Chairman*), Miss H. BAKER, Ms D. V. BREESE, Dr K. B. BRIGGS, D. R. CALDER, Prof. R. A. CHEKE, D. GRIFFIN, K. HERON, S. HOWE, K. N. IDDI, G. P. JACKSON, Dr A. G. GOSLER (*Speaker*), R. R. LANGLEY, D. J. MONTIER, Dr C. RYALL, S. A. H. STATHAM, C. W. R. STOREY, R. P. WEBSTER and P. J. WILKINSON.

Guests attending were: Mrs J. CALDER, Mrs C. R. CASEMENT, Mrs J. A. JONES and Mrs M. MONTIER.

After dinner, Dr Andy Gosler gave a most interesting talk on *Eggshell maculation in the Great Tit and other passerines*. The following is a brief synopsis.

The pigmented eggshells of birds have been subject to much debate by ornithologists for over 150 years, but for most species the pigmentation patterns have remained inexplicable. In some ground-nesting species (e.g. waders) pigmentation undoubtedly camouflages the eggs from predators, and this together with the unpigmented eggs of hole-nesting species had reinforced the view that crypsis was the principal role of pigmentation. Several non-passerine orders (e.g. owls, pigeons, woodpeckers) also have unpigmented eggs, suggesting that phylogeny is also reflected in eggshell patterning, although many of these species are also hole-nesters. For brood parasites (e.g. cuckoos), the risk of detection by a host has led to eggshell-mimicry. However, signal functions, such as crypsis and cuckoldry, cannot explain the most common pattern seen in birds (e.g. very many passerines worldwide), of a small white egg speckled with reddish-brown spots, typically forming a ring around the broad end of the egg. Studies of Great Tit *Parus major* eggs in Wytham Woods, Oxfordshire, have shown that such pigmentation is intimately related to eggshell structure, calcium availability, and water loss in incubation. In other words, while we were distracted by the patterns, we failed to appreciate that the pigments on these eggs were shell compounds related to eggshell strength and function rather than signalling.

Noteworthy bird observations in Alta Verapaz, Guatemala

by Knut Eisermann

Received 11 November 2002; revision received 20 January 2005

Basic studies of the avifauna in previously unsurveyed areas of dpto. Alta Verapaz, Guatemala, were conducted between August 1997 and March 2002, with long-term bird monitoring based on monthly point counts established in December 2001. The principal results of the research will be published elsewhere. Here I provide distributional data for rare and little-recorded species, and records that represent altitudinal range extensions.

Study areas and methods

Alta Verapaz, in Guatemala, is characterised by the transition from cloud forest (<2,500 m) to lowland rainforest. The observations described herein were made in the following areas (see Fig. 1).

Ik'bolay region (midpoint 15°51'N, 90°35'W): a small montane area in the northernmost foothills of the Sierra de Chamá, 170–700 m, at the north edge of the floodplain of the río Ik'bolay; humid evergreen broadleaf forest. Study periods: 26 August–5 September 2001, 14–25 January 2002, and December 2001–July 2004 (monthly point counts).

Cerro Peyán in Laguna Lachuá National Park (midpoint 15°50'N, 90°40'W): part of the northern foothills of the Sierra de Chamá, 170–700 m; humid evergreen broadleaf forest. Study periods: 23 July 2001, 25 May 2002, and December 2001–July 2004 (monthly point counts).

Sierra Sacranix (midpoint 15°30'N, 90°30'W): part of the Sierra de Chamá, largely uninterrupted transition from humid evergreen broadleaf forest at 400 m to cloud forest at 1,800 m; primary forest covers *c.*200 km^2, largely undisturbed owing to absence of human infrastructure. Study periods: 12–19 October 2001, 11–20 March 2002, and December–June 2004 (monthly point counts).

Pampajché (15°25'N, 90°35'W): humid evergreen broadleaf forest at 1,300–1,500 m (low-altitude cloud forest). Study period: 30 May–2 June 2000.

Yalijux (15°20'N, 90°05'W): (1) humid evergreen broadleaf forest at 2,000–2,500 m (high-altitude cloud forest), study period: 7–8 November 2000; and (2) humid evergreen forest at 600–1,000 m, study periods: September 2001, February 2002, 21 February 2002 and 31 March 2002.

Guaxac (15°20'N, 90°09'W): (1) humid evergreen broadleaf forest at 1,000–2,000 m (low-altitude cloud forest), study periods: 22–30 September 2001 and 26

February 2001; (2) pine forest at 700–1,000 m, study periods: 22–30 September 2001 and 18–27 February 2002; and (3) shade-coffee plantation under *Inga* sp. at 1,100–1,500 m, study periods: 22–30 September 2001 and 18–27 February 2002.

Caquipec (15°20'N, 90°9'W): humid evergreen broadleaf forest at 2,000–2,400 m (high-altitude cloud forest), study period: September 1997–October 1998.

The records described herein are results of casual observations and audio-visual point counts (Bibby *et al.* 1992) with a duration of ten minutes at each point and a minimum distance of 200 m between points. Censusing was conducted under the

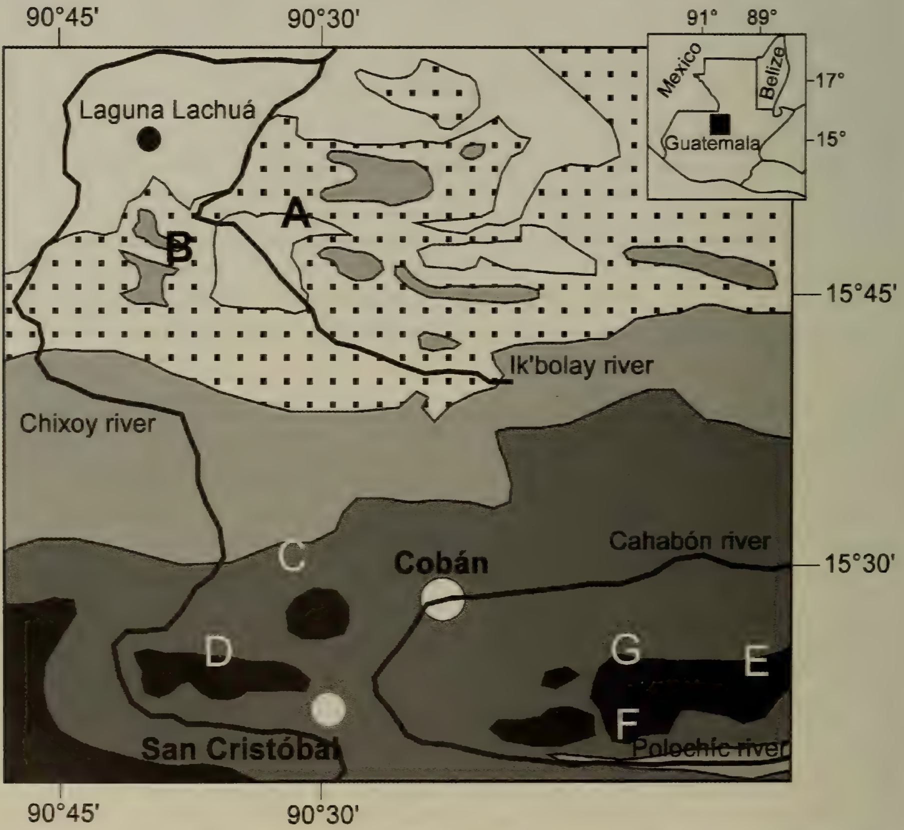
90°45'
90°30'
91°
89°
Mexico
Belize
Guatemala
17°
15°
Laguna Lachuá
A
B
15°45'
Ik'bolay river
Chixoy river
C
Cobán
Cahabón river
15°30'
D
G
E
F
San Cristóbal
Polochic river
90°45'
90°30'

Figure 1. Location of the study sites, altitudinal zones, major rivers and the towns of Cobán and San Cristóbal Verapaz. The inset map shows the location of the study area in Guatemala. Study sites: A–Ik'bolay region, B–Cerro Peyán, C–Sacranix range, D–Pampajché, E–Yalijux, F–Guaxac, G–Caquipec. Altitudinal zones: black 1,800–2,500 m, dark grey 1,000–1,800 m, pale grey 500–1,000 m, dotted 250–500 m, white <250 m.

most favourable weather conditions (no rain, no or light wind), between 0545 h and 0930 h. Point counts were conducted, in part, as fixed-radius counts, and in part with distance estimates (distance sampling, Buckland *et al.* 2001). From the latter, densities were calculated with software Distance 3.5 (Thomas *et al.* 1998). I fitted half-normal and hazard rate models to the data and used the Akaike Information Criterion (AIC) to select the model with the best fit (Buckland *et al.* 2001). Coordinates of locations were obtained using a hand-held GPS. Details concerning relevant methodologies are indicated in the species accounts, as they differ between species. Species nomenclature follows AOU (1998).

Species accounts

HIGHLAND GUAN *Penelopina nigra*

Common (daily observations) at all sites with humid evergreen broadleaf forest above 900 m (Sacranix, Pampajché, Guaxac, Caquipec and Yalijux). Never observed in coffee plantations or secondary scrub. In Caquipec and Yalijux, observations were made in low-canopy (15 m) secondary forest, adjacent to primary cloud forest. Highland Guan is commonest above 1,000 m (Andrle 1967b, Howell & Webb 1995, González-García *et al.* 2001, Komar 2002). An observation of three females at the unusually low altitude of 700 m was made on 31 March 2002, in Yalijux. Several low-altitude observations are available from Mexico: at 460 m in Oaxaca (Hoffmeister 1951), at 300 m in El Triunfo (González-García *et al.* 2001), and at 500 m (Álvarez del Toro 1980), who did not mention an observation site. Further research is needed to determine if Highland Guan is, in part, an altitudinal migrant.

Breeding was observed at two study sites. In Pampajché a nest with one egg was found on 31 May 2000 (photographed), *c.*3 m above ground in a small tree. The female was incubating. In Sacranix a pair was seen together with a mid-sized juvenile, already able to fly, on 30 June 2003. Although there are historic reports from Alta Verapaz (Salvin & Godman 1897–1904), more recent accounts did not mention the region as being within the species' range (Baepler 1962, Vannini & Rockstroh 1997). My data close a gap in our knowledge of the modern distribution of Highland Guan in central Guatemala.

SOLITARY EAGLE *Harpyhaliaetus solitarius*

Rare in northern Middle America (Howell & Webb 1995). I observed the species very well in the Sierra Sacranix (15°31'N, 90°30'W). On 13 October 2001 I saw two adults flying together, 40 m above ground over a small clearing; shortly afterwards, they began to ascend while soaring. Howell & Webb (1995) emphasised the difficulty in distinguishing Solitary Eagle from either of the black hawks, *Buteogallus anthracinus* and *B. urubitinga*, and consequently doubted some records from southern Mexico and Guatemala published since the 1980s. However, the long head in comparison to the body and the heavy bill distinguished those I observed from Common Black Hawk *B. anthracinus*, which also occurs in Sacranix. Additionally, I am very familiar with both *Buteogallus* through frequent observations on the Guatemalan Atlantic coast, at Punta de Manabique in the same year. I believe that the individuals I saw were Solitary Eagles, but I am aware that even observers experienced with raptors erroneously identify this species in the field. Together with Claudia Avendaño, Victor Xi Poou, Efraín Pop Chub and Ernesto Col, I made a further observation in Sacranix on 27 May 2003. At a small forest clearing we observed a raptor of the colour and shape of Solitary Eagle or Common Black Hawk, flying straight and fast, 200 m above the canopy. It called *ple-ple-ple...*, similar to the transcription in Howell & Webb (1995) for Solitary Eagle. I have never heard a similar call from Common Black Hawk, making me believe that it was a Solitary Eagle. Formal documentation of this species from Sacranix, either with photographs or sound recordings, is nonetheless required.

RESPLENDENT QUETZAL *Pharomachrus mocinno*

Common (daily observations) at all sites with humid broadleaf forest above 900 m (Pampajché, Sacranix, Guaxac, Caquipec, Yalijux), and also seen in low-canopy (15 m) secondary forest, adjacent to primary cloud forest. On 19 March 2002, quetzals were observed at an unusually low elevation in Sierra Sacranix, where intensive display (flights, song and calls) of at least ten birds was observed at 950 m. In northern Central America the species is considered resident at 1,400–3,000 m (Howell & Webb 1995). Records at low elevations are known only from the non-breeding season, due to altitudinal migration (Wheelwright 1983, Loiselle *et al.* 1989, Powell & Bjork 1994, Solórzano 1995, Paiz 1996). In Guatemala breeding is reported in March–June (Unger 1988, LaBastille *et al.* 1972, Paiz 1996, pers. obs.).

KEEL-BILLED MOTMOT *Electron carinatum*

Recorded at Cerro Peyán and in the Ik'bolay region. On 24 August 2001, two were observed (KE, Efraín Caal), *c.*8 m above ground, in the lower canopy of humid evergreen forest bordering the floodplain of the río Ik'bolay at 250 m (15°50'N, 90°35'W). Our attention was drawn by their short call. They were easily recognised by their broad bill, which is much wider than in Blue-crowned Motmot *Momotus momota* (the most abundant motmot at Ik'bolay and Cerro Peyán), and we also observed the large chest spots and different face pattern. Additionally, the bare shafts in the central rectrices were much shorter than in Blue-crowned Motmot. On 25 May 2002 two were heard in humid evergreen forest in the foothills of Peyán, at 250 m (15°50'N, 90°39'W, KE, Claudia Avendaño, Efraín Caal, Roberto Caal, Javier Caal). The distance between these observations is 7 km. On each of the following dates during monthly bird counts a calling bird was recorded at Cerro Peyán and the Ik'bolay region by E. Caal, R. Caal and J. Caal: 2002 (20 July, 4 August, 6–7 October); 2003 (8 January, 5 April, 13 April, 12 June, 6 October); 2004 (5 January, 11 April, 12 June). All observations were within a radius of 2 km of the first sighting.

The species is considered Vulnerable due to the small size of its fragmented populations (Hilton-Taylor 2000, BirdLife International 2004). Recently, there has been an increase in the number of observations of Keel-billed Motmot (Howell & Webb 1992, 1995, Miller & Miller 1996). In Guatemala, Keel-billed Motmot has been recorded at Laguna Perdida and Tikal, Petén (Smithe 1966, Collar *et al.* 1992), and at Cerro San Gil, Izabal (Howell & Webb 1992, Robbins & Dowell 1996). Miller & Miller (1996) mentioned an 'anecdotal historical' record near the río Chixoy, but provided no specifics. This record is probably based on an uncertain observation mentioned in Salvin & Godman (1888–1904) at Santa Ana, presumably 10 km south of San Cristóbal Verapaz (Godman 1915, Collar *et al.* 1992) (Fig. 1). Our recent observations confirm that the species is present in the northern foothills of the Sierra Chamá. It was not recorded in foothills with humid evergreen forest or at higher elevations in the Sierra Sacranix.

SLATE-COLOURED SOLITAIRE *Myadestes unicolor*
Inhabits montane humid evergreen and pine–oak forest at 800–2,700 m (Howell & Webb 1995, Stotz *et al.* 1996), and is an altitudinal migrant, reaching close to sea level in winter (Howell & Webb 1995). Andrle (1967a) reported the species at 400 m and S. N. G. Howell (pers. comm.) near sea level in the Sierra de los Tuxtlas, Mexico, in November–February.

At Cerro Peyán singing individuals were recorded on 23 July 2001 and on 7 October 2004, at 400 m. In the Ik'bolay region, two singing birds were recorded on 30 August 2001, at 500 m. No other observations were made at these sites in December 2001–October 2004. In the Sierra Sacranix it was common between 500 and 1,800 m. During a fixed-radius (40 m) point count survey in mid-March 2002 (28 points at 520–650 m, 12 at 850–1,350 m), I recorded a mean 0.4 ± 0.6 (SD) individuals per point at low elevation, and 1.6 ± 0.8 individuals at high elevation. The solitaire was recorded on 39% of the points at low and on 92% of the points at high elevation.

The following nesting data are from Sacranix: (1) nest with two eggs, adult incubating on 28 May 2003, at 1,480 m; (2) nest with two eggs, adult incubating on 28 July 2003, at 1,300 m; (3) juvenile with scalloped head and breast (see Howell & Webb 1995) in forest midstorey on 30 July 2003; (4) completed nest without eggs on 22 July 2004, nest with two eggs and incubating adult on 7 August 2004, at 1,450 m. No nests were found at lower elevations.

Point counts with distance estimation were conducted in December 2003–July 2004 at 520–650 m and 1,200–1,700 m. To calculate densities repetitions of points were pooled taking into account number of visits (Buckland *et al.* 2001). Based on nesting dates, I assume that May–July is the main breeding season. I calculated densities for both altitudinal classes during the assumed breeding and non-breeding seasons (December–March). At low elevation, 22 points were sampled 2–4 times in December–March and 3–4 times in May–July. At high elevation, 55 points were sampled 2–4 times during the non-breeding and 1–4 times in the breeding season.

TABLE 1

Number of individuals detected, encounter rate of individuals or flocks per point count (95% confidence level), and density of individuals or flocks respectively (95% confidence level) of Slate-coloured Solitaire *Myadestes unicolor* and Common Bush-tanager *Chlorospingus ophthalmicus* during the breeding and non-breeding seasons at two different altitudes in the Sierra Sacranix. Sample size (number of individuals or flocks) and effort (number of point counts) are indicated.

	Parameter	**Non-breeding**	**Breeding**
Slate-coloured Solitaire *Myadestes unicolor*			
		18 December 2003–6 April 2004	3 May–22 July 2004
520–650 m	No. of individuals detected	104	52
	No. of count points	22	22
	No. of counts	71	71
	Density (individuals/ha)	6.0 (4.3–8.3)	2.2 (1.4–3.3)
	Encounter rate	1.5 (1.2–1.7)	0.7 (0.6–0.9)
		10 December 2003–31 March 2004	6 May–23 July 2004
1,200–1,700 m	No. of individuals detected	515	548
	No. of count points	55	55
	No. of counts	208	195
	Density (individuals/ha)	6.9 (6.1–7.8)	9.3 (6.1–14.4)
	Encounter rate	2.5 (2.3–2.7)	2.8 (2.6–3.0)
Common Bush-tanager *Chlorospingus ophthalmicus*			
		18 December 2003–5 March 2004	4 April–22 July 2004
520–650 m	No. of flocks detected	28	8
	No. of count points	22	22
	No. of counts	67	87
	Density (flocks/ha)	4.6 (2.8–7.6)	–
	Density (individuals/ha)	11.9 (7.1–19.7)	
	Encounter rate (flocks)	0.4 (0.3–0.6)	–
		10 December 2003–7 March 2004	25 March–23 July 2004
1,200–1,700 m	No. of flocks detected	191	229
	No. of count points	55	55
	No. of counts	167	250
	Density (flock/ha)	10.1 (8.7–11.8)	8.2 (7.0–9.5)
	Density (individuals/ha)	26.1 (22.2–30.6)	22.7 (19.4–26.6)
	Encounter rate (flocks)	1.1 (1.0–1.3)	0.9 (0.8–1.0)

At high elevation density was higher in the breeding season and at low elevations density was higher during the non-breeding season (Table 1), supporting the assumption that birds move to lower elevations in the non-breeding season. However, density was also relatively high (2.2 birds/ha) at low elevations in the breeding season, perhaps indicating that Slate-coloured Solitaire breeds below 700 m in Sacranix, although no nest was found at this altitude. In further studies mist-netting should be conducted to investigate breeding condition of adults (brood patch, cloacal protuberance; see Mason 1938).

COMMON BUSH-TANAGER *Chlorospingus ophthalmicus*

The most abundant species in the bird community of high-altitude cloud forest in Caquipec, at 2,000–2,400 m (Eisermann 1999). In the Sierra Sacranix it was recorded at the unusually low elevation of 550 m, on 14 March 2002. Fledged juveniles were observed on 2 May 2004 in the Sierra Sacranix, and on 15 May 1998 on Caquipec (Eisermann 1999). In Costa Rica incubation and nestling time occupies *c*.27 days (Skutch 1967). Taking into account pair formation and nest building, the low-elevation record falls immediately prior to the start of the nesting season. Common Bush-tanager is common above 1,000 m in northern Middle America, with altitudinal migration to near sea level noted in Los Tuxtlas, Mexico, in winter (Howell & Webb 1995).

Point counts with distance estimation were conducted in the Sierra Sacranix from December 2003 to July 2004, at 520–650 m and at 1,200–1,700 m. At low elevation, 22 points were sampled 2–4 times in December–March, and 3–5 times in April–July. At high elevation, 55 points were sampled 1–4 times during the non-breeding and 2–5 times during the breeding season. Late March–July was assumed to be breeding season.

Common Bush-tanager was more abundant at higher than lower elevations (Table 1). At low elevation it was more abundant in the non-breeding than in breeding season, suggesting downslope migration. With only eight records during 87 point counts in breeding season, calculation of reliable density estimates was impossible. Nesting at low elevation cannot be precluded and should be investigated using mist-netting in future studies. At high elevation, density was found to be slightly higher in the non-breeding than in the breeding season (Table 1).

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Notes on breeding of Salvadori's Teal *Anas waiguiensis* and other birds in Crater Mountain Wildlife Management Area, Papua New Guinea

by Craig T. Symes & Stuart J. Marsden

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The breeding biology of many New Guinea bird species is little known (Beehler *et al*. 1986, Coates 1985, 1990, Mack 1994). For many principally Australian species information on breeding has been inferred from studies and records there (Mack 1994). Coates (1985) noted that the breeding seasons of New Guinea birds can be generally classed as: a) hawks—dry season; b) granivorous grassland and savanna species—wet season; c) insectivores and mixed feeders—late-dry to early-wet season; d) frugivores—all year; and e) waterbirds—late-wet to mid-dry season. However, such generalisations may not be applicable to regions experiencing no distinct seasonal variation in rainfall, such as occurs in the area of this study.

Breeding of birds was recorded in the Crater Mountain Wildlife Management Area (CMWMA), in the Eastern Highlands of Papua New Guinea, during a study of the importance of home-gardens (hereafter gardens; any cleared or historically altered land, principally for agricultural purposes) for insectivorous and nectivorous species. This paper serves to augment information on the breeding biology of some Papua New Guinea birds; in particular that of Salvadori's Teal *Anas waigniensis*. Breeding records, in this area with seasonally unpredictable rainfall, may be of significance to a future understanding of avian breeding biologies in the tropics.

Methods and study area

The study was conducted in CMWMA, a 27,000-ha region on the borders of Chimbu, Eastern Highlands and Gulf provinces, in the Purari River catchment. The region encompasses some of the largest sections of primary forest in Papua New Guinea, and ranges from lowland tropical forest on the Purari River (50 m) to montane forest and subalpine scrub on the summit of Crater Mountain, at 3,100 m (Mack & Wright 1996, Wright *et al.* 1997, Igag & Murphy 2002). Over a 3.5-year period, rainfall at Crater Mountain Biological Research Station (CMBRS: Fig. 1; *c.*900 m, 06°43'S, 145°05'E) averaged 6,400 mm/p.a., ranged from 180–960 mm/month and was seasonally unpredictable (Wright *et al.* 1997). Igag (2002), however, referred to the austral late autumn/early winter (March–June) as the 'dry period', when less rainfall occurred, although monthly variation did not appear significant. Humidity is high and treefalls as a result of strong winds common (Wright *et al.* 1997; CTS pers. obs.).

Evidence of birds breeding was collected from mid April to mid October 2002, at altitudes of 300–900 m (Fig. 1, Table 1). All observations were opportunistic and made north of the Pio River. Information collected on each nest was circumstantial and depended on available time. Habitats surveyed ranged from small active gardens (crops of sweet potato, sago palm, banana and vegetables), abandoned gardens of different ages, little-disturbed primary forest (subject only to periodic hunting and small-tree removal), and pristine lowland to hill forest (Paijmans 1976). Details of Palm Cockatoo *Probosciger arterrimus*, Eclectus Parrot *Eclectus roratus* and Pesquet's Parrot *Psittrichas fulgidus* are not included here, as they have been presented earlier (Igag 2002), and information on Sulphur-crested Cockatoo *Cacatua galerita* nests is also not given here (except in two examples, see Rainbow Lorikeet *Trichoglossus haematodus* and Grey Crow *Corvus tristis* accounts) as cavities were high in canopy trees and were not inspected.

Feeding and functional guilds are indicated thus: a) Haw = hawks, b) Gra = granivores, c) Ins = insectivores and mixed feeders, d) Nec = nectarivores [not considered by Coates (1985)], e) Fru = frugivores, and e) Wat = waterbirds (Coates 1985, Beehler *et al.* 1986). Specific nest dimensions are indicated by OD (outside diameter of nest bowl) and ID (inside diameter of nest bowl). Nest depth refers to the bowl and nest length refers to total vertical dimension. The approximate altitude at which each nest was recorded is also presented. Nomenclature follows Beehler *et al.* (1986).

Nests for which specific information was provided by landowners is referenced (LO pers. comm.) and those where information was proffered by Trained Local Observers as (TLO pers. comm.). TLOs are local landowners, knowledgeable in local fauna and flora, trained to assist visiting researchers and dedicated to promoting sustainable use of the environment through research and eco-tourism. Most nests were positively identified by CTS, by observing the nest or adults of the respective species in nest attendance, and are indicated (CTS pers. obs.).

TABLE 1

Study areas within CMWMA in which nests and breeding were observed. Nests recorded in Results are noted as being observed in the vicinity of one of these settlements or the research station (CMBRS) (see Fig. 1).

Settlement	Habitat type	Altitude (m)	Grid reference
Haia	Hill/lowland forest transition, village established 1970s around airstrip, high levels of disturbance and active gardens closer to village	650–830	06°42'S, 144°59'E
Yabaramaru	Lowland forest, village established after Soliabedo abandoned (National Mapping Bureau 1985)	300–450	06°43'S, 144°50'E
Yualaido	As previous site	300–400	06°43'S, 144°52'E
Wara Oo	Hill and lowland forest, small village of *c.*100 people, lower levels of disturbance with increased distance from settlement	450–650	06°45'S, 145°02'E
CMBRS	Hill forest, research station established late 1980s, moratorium on hunting and gathering in area	850–950	06°43'S, 145° 05'E

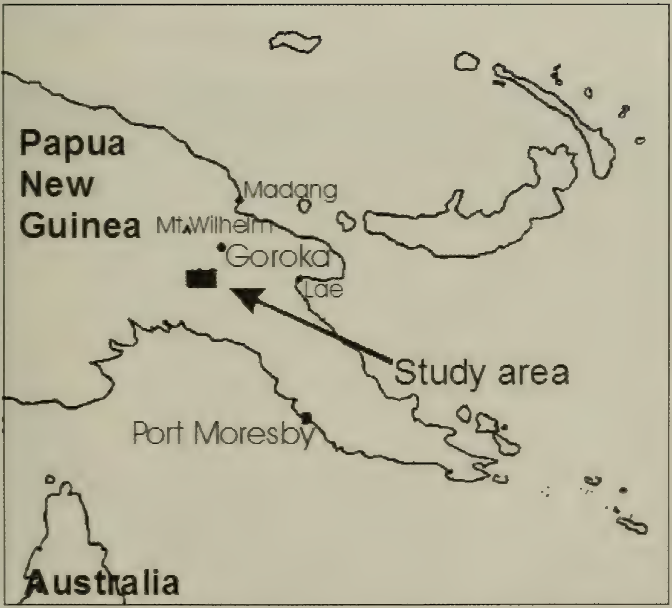

Figure 1. Map showing general area of the Crater Mountain Wildlife Management Area where the study occurred.

TABLE 2

Egg-laying months (extrapolated for those nests without eggs) of birds in CMWMA. Guilds include: a) granivores, b) insectivores and mixed feeders, c) frugivores, and d) waterbirds (Coates 1985). Only months in which the study was conducted are shown. Number of records is given together with the number of species in parentheses. Months in which least rainfall was recorded at Haia (1998–2001) are shaded (March–June) (Igag 2002).

Guild	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**TOTALS**
Granivore					1			1 (1)
Insectivore and mixed			1	8	6	9	2	26 (15)
Frugivore	4	2	2	3			1	12 (8)
Water				1	1	2		4 (2)
Totals	4	2	3	12	8	11	3	43 (26)

Results

Nests recorded in this study are summarised below. Those species recorded nesting by Mack (1994) are indicated *. Thirty-two species in 17 families were recorded breeding in CMWMA. Egg-laying month was estimated for each observation of an active nest. These are summarised in Table 2 for all breeding records and are also presented in parentheses at the start of each breeding observation account. Species allocated to more than one guild were considered mixed feeders. Not all breeding records are presented below, as some do not amplify existing data (five species in four families) (Coates 1985, 1990, Mack 1994).

Mean clutch size for open nesting birds was 1.5 (*n*=26) (an open nest being defined as one in which the nest bowl is exposed to the environment from above). The mean number of nestlings recorded per nest (1.2; *n*=9) was lower (due to predation, egg infertility, nestling death, other loss) than the mean number of eggs per nest (1.6; *n*=17) (waterbirds excluded from means).

Nest records

SALVADORI'S TEAL *Anas waiguiensis* (Wat)

Haia (440 m): a large tree growing at *c*.45° over the Mei River (between the Je and Nimi rivers; 06°43'S, 144°57'E) contained an old nest (TLO pers. comm.). The site, *c*.6 m above the river, was set in vegetation and epiphytes on the upper side of the main trunk. One egg was removed two years previously (LO pers. comm.).

Yabaramaru (305 m): an island on the Wi River harboured several old nests (LO pers. comm.). On 28 July, four separate shallow depressions within a 10-m radius, scraped in the soil and concealed by grass, were identified as having previously been used (LO pers. comm.). A local landowner indicated that one nest had contained three eggs and another had produced four chicks in *c*.1997 (LO pers. comm.). Another possible nest further upstream was not visited (LO pers. comm.).

Haia (August, 630 m): on 24 August an incubating bird was flushed from a nest on a large boulder island in the middle of the Nimi River (Fig 2, CTS pers. obs.).

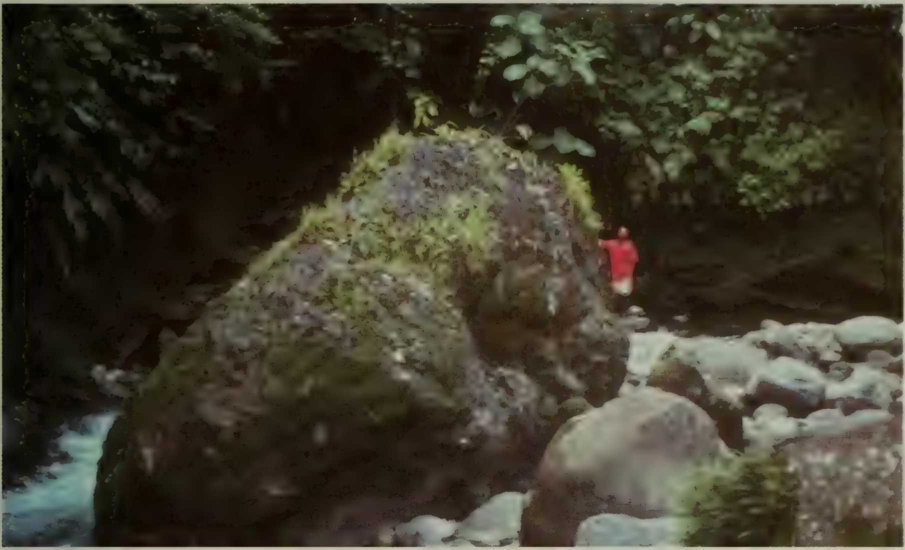

Figure 2. Large boulder island in the Nimi River where a Salvadori's Teal *Anas waiguiensis* nest was identified. An incubating bird was flushed off the nest site at the apex of the rock. The river level was relatively low, flowing only one side of the rock during nest inspection (Craig T. Symes)

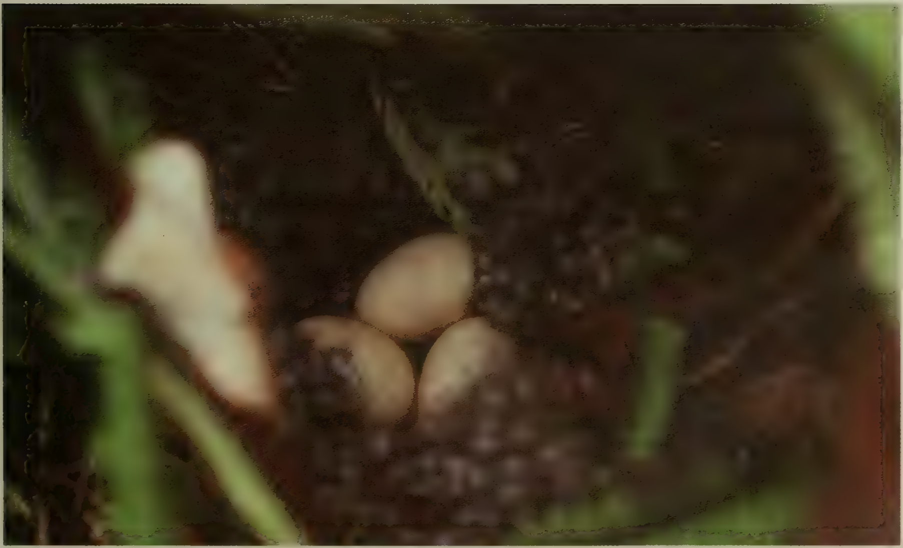

Figure 3. Salvadori's Teal *Anas waiguiensis* nest on large boulder island in Nimi River, showing exposed eggs after the incubating bird was flushed off the nest (Craig T. Symes)

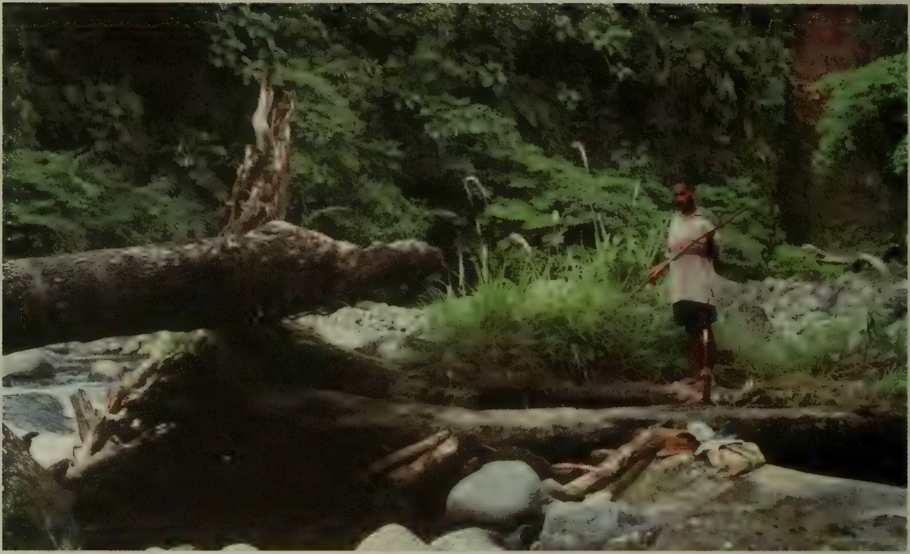

Figure 4. 'Log island' in the Nimi River with TLO, Ijenepe Houmore, indicating site of the Salvadori's Teal *Anas waiguiensis* nest (Craig T. Symes)

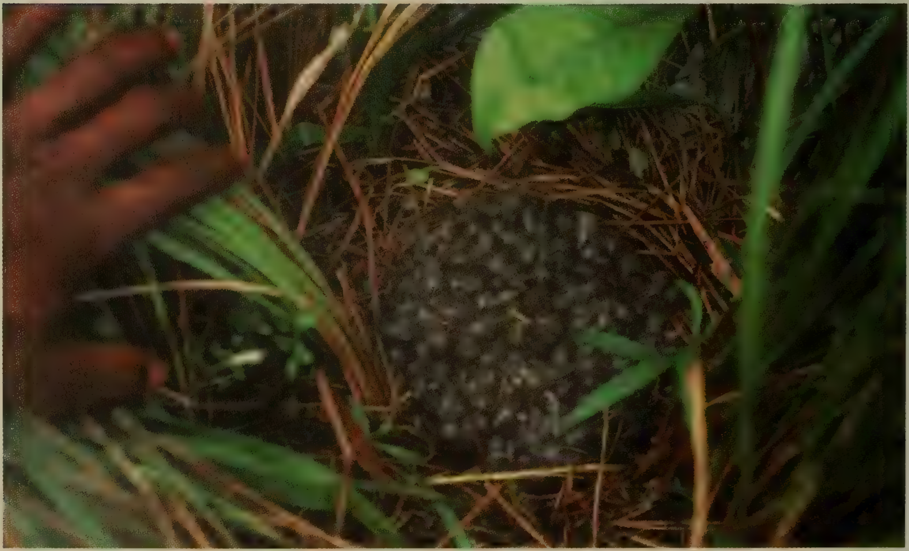

Figure 5. Salvadori's Teal *Anas waiguiensis* nest on 'log island' on the Nimi River, showing down covering eggs. The adults were absent (Craig T. Symes)

The river was low and only flowing west of the island at the time. During higher rains the rock is surrounded by water (TLO pers. comm.). The rock was *c.*4 m high on the accessible side (rock diameter *c.*6–10 m) with grass and small shrubs covering the top 2 m of exposed rock. Three cream-white eggs were partially hidden by off-white down in a grass nest (OD *c.*20 cm, ID *c.*9 cm). On 21 August three eggs were in the nest (LO pers. comm.) (Fig. 3).

Haia (September, 770 m): on 20 August (hereafter Day 1) a possible nest on a small 'log island' in the Nimi River north of Haia was discovered (TLO pers. comm.), it being a scrape in the soil, concealed by grass growing on the log (CTS pers. obs.). Water level was low and the river only flowed east of the 'island'. The log, which had become attached to rocks in the river, was *c.*10 m downstream from a crossing point in the river (the path from Haia to Karamui) (Fig. 4). Visits to the nest site attempted to minimise disturbance and only involved peering at the nest when the adults were absent, and then departing. The following is a record of visits to the site (CTS pers. obs., TLO pers. comm.). *Day 7*: on approaching the nest one bird flew from nearby and settled *c.*20 m upstream on exposed rocks in the river. It remained until CTS and a TLO departed *c.*10 minutes later. The scraping appeared deeper, being a shallow depression in the damp soil. *Day 10*: the scrape was finely lined with dry grasses. *Day 12*: the nest was lined with more dry grasses and two small green fern fronds. Another scraping was observed in the ground *c.*50 cm away, possibly from where nest material had been collected. *Day 13*: a single cream-white egg was present in the nest, which was still lined with grass. No birds were seen. *Day 14*: the nest was as the day before, but the egg was finely smeared with dirt and mud. *Day 16*: as previous inspection; no birds were observed. *Days 18 & 20*: two eggs were present. *Days 22 & 24*: three eggs were present; the nest was still lined only with grass. *Days 26 & 29*: a bird was at the nest and was not disturbed. *Day 32*: an incubating bird was flushed and flew upstream out of sight. The nest had four eggs and was lined with a thick layer of down. *Day 38*: no bird was observed at the nest but one was seen flying upstream. It briefly settled on a submerged rock before moving into some rapids. The nest had four eggs, nestled beneath a layer of down feathers. *Days 42 & 44*: the four eggs were covered with feathers and an adult was foraging downstream (Fig. 5). *Days 48, 50, 52 & 54*: the nest appeared abandoned probably due to human passage along the nearby footpath or observer disturbance.

Haia (September, 740 m): on 10 September four eggs were in a nest on a large rock beside the Ware River (a tributary of the Ooh east of Haia) (TLO pers. comm.). The nest was set in a hollow in grass on the riverbank and lined with feathers (M. Opiang pers. comm.). On 21 September the nest was empty, the eggs possibly removed by humans.

A report from a landowner who removed 15 eggs from a nest on an island on the Nimi River is considered suspect given the numbers of eggs observed in nests in this study (TLO pers. comm.). Salvadori's Teal was also indicated to occur regularly on a stretch of river (width 30–50 m) near the Torrent Flycatcher nest on the Je (TLO pers. comm.). A landowner assured CTS that birds roosted on a large boulder (height 2 m above water, diameter *c.*8 m) in the middle of the fast-flowing river *c.*1 km downstream of the flycatcher nest. A teal feather was found on a rock but no birds were seen during observations one evening. The species was also reported to occasionally occur on the Pio River (TLO pers. comm.) (river width 50–100 m), a more turbid river (CTS pers. obs.).

GREY-HEADED GOSHAWK *Accipiter poliocephalus* (Haw)
Haia (840 m): on 25 August an adult was flushed from a nest in a subcanopy tree (nest height 6.5 m; tree height *c.*14 m) (TLO pers. comm.). The tree was at the edge of an active garden north of Haia. The nest, a deep bowl of twigs and small branches, was lined with leaves and set against the main trunk. On 1 and 4 September the nest was still empty (CTS pers. obs.).

BROWN CUCKOO-DOVE *Macropygia amboinensis* * (Fru/Gra)
Haia (May, 875 m): on 27 May an adult was flushed from a nest, *c.*6 m above ground, in the fronds of a *Pandanus* sp. (tree height *c.*8 m; dbh 17.5 cm above support roots). The forest canopy was open. On 7 June a male was sitting on the same nest.

GREAT CUCKOO-DOVE *Reinwardtoena reinwardtii* * (Fru/Gra)
Wara Oo (April, 550 m): on 12 May a nest on a ledge (height 2.4 m, dimensions 20 x 80 cm) *c.*1.5 m from a small waterfall contained one chick covered in pinkish-white down. The nest was a shallow bowl sparsely lined with fine plant material. An adult flew off on approaching the nest (CTS pers. obs.). A week earlier a single egg was in the nest (TLO pers. comm.).

Yabaramaru (July, 480 m): on 22 July a bird incubating a single white egg was flushed from a nest on a cliff ledge *c.*12m above ground (CTS pers. obs.). The *c.*25 m-high cliffs formed the entrance to a large sinkhole, in a valley, in pristine forest.

Yabaramaru (June, *c.* 450 m): on 24 July young boys brought CTS a nestling they had collected from a cliff nest in nearby forest. The nestling was adult size, with blue-black feathers and a half-grown tail; the legs and bill were black.

WOMPOO FRUIT-DOVE *Ptilinopus magnificus* (Fru)
Yabaramaru (July, 440 m): on 29 July a bird was incubating a single white egg in a nest *c.*6 m above ground in a forest understorey tree (dbh 22 cm). The nest was flat, with a base of small sticks and twigs, lined on the upper surface with smaller twigs and vine tendrils, sited in little-disturbed lowland forest. On 3 August the nest appeared destroyed, possibly by debris falling from the canopy (CTS pers. obs.).

SUPERB FRUIT-DOVE *Ptilinopus superbus* * (Fru)
Wara Oo (May, 750 m): on 14 May a single white egg was in a nest on a branch (diameter 4.5 cm) of a small understorey tree (dbh 20 cm) (CTS pers. obs.). The

nest was a sparse platform of rigid twigs, with no evident bowl, at a height of 2.65 m. An adult flew off on approaching the nest (TLO pers. comm.).

Yualaido (July, 440 m): on 31 July a female was flushed from a nest at a height of 2.5 m. The nest was a thin layer of rigid twigs sited in the fork of a horizontal branch of an understorey tree of *c*.6 m (dbh 4 cm). A single white egg was visible from below (CTS pers. obs.).

BEAUTIFUL FRUIT-DOVE *Ptilinopus pulchellus* * (Fru)
Wara Oo (635 m): on 5 October a male was flushed from an empty nest in an understorey tree in little-disturbed forest. Next day the nest was still empty (CTS pers. obs.).

ZOE IMPERIAL PIGEON *Ducula zoeae* (Fru)
Haia (April, 760 m): on 23 April a bird was observed at a nest in a large tree within an abandoned coffee plantation. The nest was *c*.13 m above ground in the outermost branches (CTS pers. obs.).

RAINBOW LORIKEET *Trichoglossus haematodus* (Nec/Fru)
Haia (770 m): on 8 May a pair was seen entering a cavity between the branch of a large canopy tree and a mass of ferns and epiphytes growing on the branch. The cavity was *c*.20 m above ground. At the same time a pair of Sulphur-crested Cockatoos was active at another cavity (height *c*.25 m) in the same tree (CTS pers. obs.).

GLOSSY SWIFTLET *Collocalia esculenta* (Ins)
Yabaramaru (June, *c*.450 m): on 24 July young boys brought CTS three nests of the species. Each contained a single nestling at different stages of development. The nests had been removed from a low cliff in nearby pristine forest (see Great Cuckoo-dove). Each nest was a small delicate cup of plant material, neatly lined on the outside with fine live moss.

RUFOUS-BELLIED KOOKABURRA *Dacelo gaudichaud* (Ins)
Yabaramaru (490 m): a cavity (diameter *c*.7 cm, entrance height 3.2 m) within a spherical ant nest (diameter *c*.70 cm) was pointed out by a landowner as an old breeding site. The nest was in a *Pandanus* sp. (dbh 13 cm) in a recently abandoned garden. The cavity was in use by bees when inspected on 22 July.

DWARF KINGFISHER *Ceyx lepidus* (Ins)
CMWMA (400–800 m): excavated cavities (fresh and old) were frequently observed at the base of treefalls. The soil lifted by the roots of the fallen tree provided a near-vertical bank into which the excavations were made (CTS pers. obs.). These cavities were indicated as Dwarf Kingfishers nest sites by TLOs. Some were shallow cavities and, being next to paths, were likely abandoned, and in some

the end was not visible. None was thoroughly inspected. A Dwarf Kingfisher was observed in an abandoned garden, leaving a freshly worked cavity on the underside of a toppled tree.

BLYTH'S HORNBILL *Rhyticeros plicatus* (Fru)
Wara Oo (April, *c.*600 m): an unidentified tree species felled by a landowner in mid April contained four eggs (TLO pers. comm.). A sample of the nest plug brought to CTS had a distinctive aromatic citrus smell (CTS pers. obs.).

WHITE-BELLIED THICKET FANTAIL *Rhipidura leucothorax* (Ins)
Yualaido (July, 465 m): on 1–2 August two pale brown eggs, speckled darker brown at the broad end, were being incubated in a nest suspended from a dead vine on a sago palm *Metroxylon sagu* (CTS pers. obs.). The nest, lined on the outside (OD 7 cm) with dry bamboo and sugarcane leaves bound with spider web silk, was lined smoothly in a neat bowl (ID 6 cm) with spider silk. The nest was *c.*15 cm long with the base a tapering 'tail' of fine hanging material and spider silk. The nest was 2.5 m above a small stream (width 2 m), directly above a small log bridge.

CHESTNUT-BELLIED FANTAIL *Rhipidura hyperythra* * (Ins)
Haia (July?, 835 m): on 4 September a nest adjacent to a regularly used trail (*c.*3 m wide) in little-disturbed forest was indicated as belonging to the species (TLO pers. comm.). It appeared to have been used recently and was sited in the horizontal branch of an understorey tree at a height of 3.3 m. The nest was a neatly compacted mesh of fine plant material and spider webs. A 0.5–1.0-cm portion of the nest lip was raised in a small bump. Nest length was 8–10 cm with threads of material hanging below the nest.

NORTHERN FANTAIL *Rhipidura rufiventris* (Ins)
Haia (August, *c.*830 m): on 4 September a bird was incubating two eggs in a nest in a garden tree (nest height 3.1 m, tree height *c.*5 m). The eggs were white, lightly speckled rufous-red (LO pers. comm.). The nest was a neatly compacted bowl of woven plant material and spider webs sited in a horizontal fork (CTS pers. obs.).

HOODED MONARCH *Monarch manadensis* (Ins)
Yualaido (July, 450 m): two dark brown eggs, speckled darker at the broad end, were being incubated on 2 August. The nest, 1.65 m high in the fork of a small understorey tree (dbh 1.5 cm, height *c.*2.5.m), was a neat bowl (OD 10 cm, ID 4.5 cm) lined inside with fine epiphyte roots. Fresh moss on the outside hung below the nest in a 'tail' (nest length 22 cm). Two other nests, thought to be of monarchs (TLO pers. comm.), were found: on 4 September (empty but with fresh faeces) and 25 September (one egg).

TORRENT FLYCATCHER *Monachella muelleriana* (Wat)
Yualaido (July, 470 m): on 3 August a nest, a neat bowl of finely woven epiphyte roots, the exterior lined with moss (OD 9 cm, ID 6 cm, length 6 cm, depth *c.*2 cm), was observed on the ledge of a large boulder in the Je River. The nest was *c.*2.5 m above the water and 30 cm below the top of the boulder, on which grass was growing. A nestling in pin, and a pale brown egg with darker brown patches, were present in the nest (CTS pers. obs.).

BANDED YELLOW ROBIN *Poecilidryas placens* (Ins)
Haia (July, 760 m): on 22 August a fully feathered nestling was observed in a nest in pristine hill forest (CTS pers. obs.). The nest (length 2 cm, depth *c.*1 cm) was 1.7 m above ground in a low (3.3.m) understorey tree (dbh 3 cm), on the horizontal fork of a side branch, and was constructed of tendrils and fine epiphyte roots, lined on the outside with moss. On 26 August the nest was empty and the nestling had perhaps fledged (CTS pers. obs.).

Wara Oo (August, 580 m): on 30 September a small nestling was observed in a nest (height 2.1 m) in an understorey shrub (height 2.5 m) in pristine forest. The nest, set on a horizontal side branch, was a shallow bowl of finely woven epiphyte roots and plant material, with live moss on the outside (OD 9 cm, ID 5 cm).

GREY WHISTLER *Pachycephala simplex* (Ins)
Haia (August?, 830 m): a nest *c.*12 m above ground was observed under construction in a tree (height *c.*15 m) on the edge of an active garden. The nest was in the foliage of a horizontal side branch. On 30 August an adult was seen bringing a 3–4-cm dry leaf to the nest. On 3 September, in 14 minutes, an adult was seen bringing an epiphyte root (*c.*5 cm long), a dry leaf with only the veins remaining (*c.*6 cm) and a grasshopper to the nest (CTS pers. obs.).

LITTLE SHRIKE-THRUSH *Colluricincla megarhyncha* * (Ins)
Haia (September, 760 m): on 20 September a nest, the inside lined with fine epiphyte roots and plant material, and the outside with large dead leaves, was found beside a footpath within little-disturbed forest. The nest (OD 14 cm, ID 7 cm, length 14 cm) was set against the main stem of a small understorey tree (dbh 4 cm, height 2.1 m) at a height of 1.4 m, and contained two cream-brown eggs, speckled brown all over, with a darker band of almost complete brown at the broad end. On 26 September the two eggs were still present (CTS pers. obs.).

Wara Oo (September, *c.*570 m): a nest, 2.15 m above ground, was found on 30 September in a subcanopy tree (height *c.*23 m) in pristine forest. It was observed again on 1 October. A single cream egg, speckled dark brown all over, more lightly at the narrow end, was missing on 2 October. The nest (OD 12 cm, ID 6 cm, length 11 cm) was set in a leaf whorl near the main trunk (dbh 3 cm). The outside of the nest was a rough layer of leaves and twigs (CTS pers. obs.).

RUSTY PITOHUI *Pitohui ferrugineus* * (Ins/Fru)
Yualaido (July, 445 m): a single pale blue egg, lightly flecked brown, green and red at the broad end, was found on 18 July. The nest (OD *c.*13 cm, ID *c.*8cm, length *c.*11 cm) was in the fork of a climber on a small forest understorey tree (dbh 2.5 cm, height 4 m) at a height of 2.3 m. It was a neat bowl, the outside a mesh of vine and tendril twigs, the inside lined with fine bark and epiphyte roots. The habitat was little-disturbed lowland forest (e.g. small-tree removal) (CTS pers. obs.).

Haia (October, 780 m): on 14 September a bird was observed constructing a nest 3.15 m high in an understorey tree within a home-garden clearing. On 28 September the nest was still empty. On 22 October a small nestling, covered in brown feathers, was observed in the nest (length *c.*15 cm, OD *c.*12 cm). The outside of the nest was an untidy arrangement of twigs and sticks, and was set in a fork of the main trunk (dbh 4.5 cm) (CTS pers. obs.).

Observations at this nest suggested that the period between nest construction and egg laying is at least two weeks.

BLACK BERRYPECKER *Melanocharis nigra* * (Ins/Fru)
Wara Oo (September, 600 m): on 30 September an adult was observed incubating at a nest (height 2.25 m) in an understorey tree (height 2.5 m, dbh 2.0 cm) within pristine forest (CTS pers. obs.). The nest was a tightly woven cup (OD 5 cm, ID 4 cm, length 6 cm) of fine epiphyte roots with lichen on the outside, and was sited in the fork of a small horizontal branch. The two eggs were creamy-white blotched dark brown, heaviest at the broad end. The incubating bird and eggs were observed again on 1, 2 and 6 October.

BLACK SUNBIRD *Nectarinia aspasia* (Nec/Ins)
Haia (August, *c.*795 m): on 11 August a pair was observed nest building in the foliage of an understorey tree at a height of *c.*8 m. The site was in little-disturbed hill forest.

LONG-BILLED HONEYEATER *Melilestes megarhynchus* * (Ins)
Haia (July?, 835 m): on 19 September an adult was observed feeding a juvenile in the subcanopy of second-growth forest.

DWARF HONEYEATER *Oedistoma iliolophus* * (Ins/Nec)
Yualaido (July, 455 m): a nest indicated as of this species was observed on 18 July in a small tree in an active garden (LO pers. comm.). The nest was sited 1.45 m above ground in a 2.5 m-high tree (dbh 5.5 cm). Two white eggs were present in the deep bowl of bamboo leaves and grass, lined with finer plant material (OD 9 cm, ID 4 cm, length 11 cm) (CTS pers. obs.). The nest was probably abandoned due to the increased presence of gardeners in the vicinity.

Haia (August, *c.*810 m): a nest under construction was observed on 24 August in a small (1.2 m) understorey shrub in mildly disturbed hill forest. The nest was

0.75 m above ground and shielded by fern fronds *c*.10 cm above the nest. On 27 August the nest (OD 9 cm, ID 4.5 cm, length 8 cm) of fine woven plant material and epiphyte rootlets was unlined, but on 3 September it was lined with fine clear white seed material and contained one white egg, finely speckled pale rufous at the broad end. On 4 September an adult was observed incubating at the nest, the bird's bill only just visible. On 19 September the nest was empty.

Haia (October, 830 m): on 28 September a nest was observed under construction 1 m high in an understorey shrub in pristine forest (TLO pers. comm.).

SCRUB WHITE-EARED MELIPHAGA *Meliphaga albonotata* (Ins/Fru)
Yualaido (July, 445 m): on 18 July a nest with two cream eggs, lightly speckled dark brown, was found in a garden tree (*Ficus* sp., dbh 17 cm, height *c*.15 m) at a height of *c*.11 m (CTS pers. obs.). The nest was constructed of woven bamboo leaves and moss, well camouflaged in the tree canopy. On 29 July, two lightly feathered nestlings were present (TLO pers. comm.).

Haia (September, *c*.800 m): on 4 September a nest was observed under construction at a height of *c*.7 m in a 16-m subcanopy tree within an abandoned garden. The nest was a fine ball of intertwined moss, grass and white seed material, with some leaves, and was set in a horizontal fork, with most of the nest set below the branch. On 25 September the nest was complete.

Haia (September, 775 m): on 28 September a nest (OD *c*.8 cm, ID *c*.7 cm, depth *c*.8 cm) was found 2.3 m above ground in a shrub (dbh 5 cm) in regrowth within an abandoned garden (CTS pers. obs.). The thin-walled nest of fine grass and bamboo leaves, with moss embedded, was lined with fine white seed material. Like the previous nest, the top was level with the branches in a horizontal fork. Two nestlings, with grey-black skin and in pin, had bright yellow gapes and opened their eyes when alert.

Wara Oo (September, 610 m): on 29 September a single pinky-cream egg, speckled dark rufous at the broad end, was observed in a nest 2.3 m above ground (CTS pers. obs.). The nest (OD *c*.8 cm, ID *c*.7 cm) was woven onto the branches of a horizontal fork in a tree (dbh 5 cm, height *c*.3.5 cm), the top of the nest level with the branches. The nest was flimsy with moss on the outside and fine woven grass on the inside, lined with fluffy white seeds. The egg was still present on 2 October.

Haia (September, 730 m): on 29 September two nestlings were observed soliciting food in a nest (height 2.4 m) in the horizontal fork of a creeper within a large canopy tree. The top of the nest was set below the branch and was a thin-walled construction of moss and leaves. Habitat was near-pristine forest.

TAWNY-BREASTED HONEYEATER *Xanthotis flaviventer* (Fru/Ins)
Haia (*c*.790 m): on 1 September an adult departed after removing a tendril from the branch of a subcanopy tree in an abandoned garden (CTS pers. obs.).

STREAK-HEADED MANNIKIN *Lonchura tristissima* * (Gra)
Haia (August, 775 m): on 31 August a nest indicated as of this species was observed in an abandoned garden without trees (LO pers. comm.). The nest (OD 7 cm, ID 4 cm), an untidy woven ball of coarse grass and bamboo leaves, was 1.6 m above ground within the foliage of a shrub. It contained four eggs, three pale brown, speckled rufous, and the other white, flecked brown at the broad end. Such discrepancy in egg coloration is only readily explained if the nest had been parasitised by a cuckoo, although such behaviour is unmentioned in the secondary literature (Restall 1996, Payne 1997). Both Brush *Cacomantis variolosus* and Chestnut-breasted Cuckoos *C. castaneiventris* were regularly recorded near the nest, and the egg of the former species is apparently rather similar to that observed here (Payne 1997). The nest appeared abandoned due to disturbance and tampering, or due to being parasitised (CTS pers. obs.).

TORRENT-LARK *Grallina bruijini* * (Wat)
CMBRS (875 m): on 14 October an adult was flushed from an empty nest on an exposed branch dangling *c*.2 m above a fast-flowing stream. The nest was a compacted construction of mud and plant material, including epiphyte roots, atop a flexible branch thinner than the nest (OD 12 cm) (CTS pers. obs.).

HOODED BUTCHERBIRD *Cracticus cassicus* (Ins)
Haia (770 m): on 22 September an adult was observed transporting a large twig to a nest *c*.18 m high in a large *Terminalia* sp., within an old garden. The nest, a sparse layer of twigs and small branches, was possibly still being constructed. A maximum of five birds was observed in the immediate vicinity during mid morning, calling and displaying in a 50-m radius (CTS pers. obs.).

GREY CROW *Corvus tristis* * (Fru)
Yabaramaru (510 m): on 24 July a landowner showed CTS an old nest site, reputedly used by this species in the past (LO pers. comm.). The large nest of OD *c*.50–60 cm was at least 25 m high in the fork of a canopy tree (*Motu*, height *c*.32 m, dbh 3.24 m) (CTS pers. obs.).

Haia (770 m): a nest tree, *c*.2 km north-west of Haia, indicated to have been used by this species was shown to CTS by a local landowner. The nest, a platform of large twigs, was *c*.35 m above ground, near the top of a large canopy emergent. A Sulphur-crested Cockatoo was observed using a cavity in the same tree (see Rainbow Lorikeet account).

Haia (June, 790 m): on 27 August two juveniles were observed soliciting from adults *c*.1 km north of Haia in forest at the edge of a recently abandoned garden.

Discussion and concluding remarks

Salvadori's Teal nests observed on the Wi River during this study were probably further downstream than those recorded by Diamond (1972). Those noted by

Diamond (1972) in July were described as grass-lined depressions on a riverside rock, but they were probably inactive. These are low-altitude records for a species that prefers clear, fast-flowing alpine streams (Diamond 1972, Coates 1985). Habitat quality, rather than altitude, is thus more likely an important factor in determining the range and breeding distribution of Salvadori's Teal (Diamond 1972). On Mount Wilhelm (above 3,215 m), on the lower Pindauande Lake, two nests in which eggs had already hatched were found in consecutive years (Smith 1976). Egg remains in these nests, both on a mossy ledge *c*.1 m above water level, suggested that no more than 2–3 eggs were laid in each (Smith 1976). Further, the observation of only a single pair on the lake suggested that both nests belonged to the same pair (Smith 1976). It is therefore unknown whether the four nest scrapes found on the Wi in this study were made by a single (the same?) pair in successive years or more than one pair in the same year. Based on Smith (1976) and the infrequent sightings of large flocks on rivers in the region, we suggest that the same pair returned annually to a traditional or safe nest site. In two consecutive years (1971/72) ducklings with adults were observed in August and July (Smith 1976), indicating earlier egg laying than in our study.

Observations made on 24 March–10 November 1977 regularly recorded small numbers of Salvadori's Teal on the Baiyer River, where the species was often seen feeding at a point where the river rushes over rocky outcrops (Bishop 1977). On 14 October 1977 two young were brought to the Baiyer River Wildlife Sanctuary but subsequently died (Bishop 1977). In October of another year, four ducklings were brought in and marked with broad black and white stripes (Bishop 1977). These dates accord with breeding times recorded in our study, months most likely to be considered the dry season outside the study area.

It is difficult, given the few data, to determine breeding seasons of respective guilds in relation to any minor variation in rainfall. We therefore suggest that a combination of factors (e.g. day-length, seasonal food availability and natural breeding cycles) trigger breeding in the region. However, at CMBRS, over a 3.5-year period, no seasonal variation in overall fruiting patterns was detected (Wright *et al.* 1997). If any pattern of rainfall is detectable at Haia (Igag 2002) then most frugivore breeding records were in the dry season and insectivore and mixed feeders in the early-wet. Very few species recorded in our study can be considered strict nectarivores, thus if nectarivore records are grouped with mixed feeders the number of records for this guild in the early-wet season increases (Table 2). All waterbird records were in the early-wet season, according with Bishop (1977), Diamond (1972) and Coates (1985).

In lowland forest, Bell (1982) noted avian breeding seasons to be in the late-dry season (September–October, austral spring), although breeding occurred year-round. Mixed feeders, including honeyeaters, had patterns similar to carnivores, breeding during the dry season, peaking in December (Bell 1982). Our study may possess insufficient data to make interpretations on an annual scale, but there is evidence to suggest a distinct difference in breeding times between guilds.

Few waterbirds occur in Crater Mountain yet all three known residents were recorded breeding (Mack 1994). It is probable that they always breed close to fast-flowing rivers and that nest failures as a result of rapid fluctuations in water levels due to heavy rains may occur. During our study all waterbird records were in the early-wet season, according with Bishop (1977), Diamond (1972) and Coates (1985).

In CMWMA Eclectus Parrots showed no seasonality in breeding patterns, although Vulturine Parrots and Palm Cockatoos did, breeding in the wet season (July–November) (Igag 2002). The more specialised diets of the latter two may be instrumental in determining breeding patterns.

Thirty-six species were incidentally recorded breeding at CMBRS during *c.*30 months (May 1990–March 1993) research on Dwarf Cassowary *Casuarius bennetti* (Mack 1994). The CMWMA encourages research as an alternative income to logging for local communities. However, researchers tend to conduct short-term studies in the area and incidental information collected is 'lost' in offices and files at various research institutions. By publishing these data, questions concerning the breeding biology of birds in tropical regions can begin to be addressed.

Acknowledgements

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On the type series of *Macropsalis kalinowskii* (Berlepsch & Stolzmann 1894) (Caprimulgidae)

by Nigel Cleere

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Swallow-tailed Nightjar *Uropsalis segmentata* is a little-known Andean species that inhabits montane forests from central Colombia south to central Bolivia (Cleere 1998, 1999, Holyoak 2001). Two races are currently recognised, *U. s. segmentata* (Cassin 1849) in Colombia and Ecuador and *U. s. kalinowskii* (Berlepsch & Stolzmann 1894) in central Peru to central Bolivia. They differ in the size and markings of the outer tail feathers in adult males.

The nominate race was described under the name *Hydropsalis segmentatus* by Cassin (1849) from two Bogotá specimens originally in the Rivoli collection. The specimens were identified as a middle-age male and young female, and are now deposited in the Academy of Natural Sciences in Philadelphia (ANSP), where they were documented as ANSP 21.939 male, type, and ANSP 21.941 by Stone (1899). The nomination of ANSP 21.939 as the type was an act of lectotypification by Stone and ANSP 21.941 therefore became a paralectotype.

Macropsalis kalinowskii was described by Berlepsch & Stolzmann (1894) from eight specimens, five males and three females, collected by J. Kalinowski at Pariayacu, near Maraynioc, in central Peru on 26 October 1891, 5 and 6 November 1891, 12 December 1891, 16 September 1892 and 26 February 1893. The types were stated to be in the Branicki [*sic*] collection and the Berlepsch collection, although these have since been sold or transferred to the Museum and Institute of Zoology, Warsaw, Poland (MZPW), and the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany (SMF). The type material of *M. kalinowskii* has received very little subsequent attention and only two specimens appear in modern type catalogues. A male deposited in the Museum and Institute of Zoology, Warsaw (MZPW 2287) was recorded as the type by Sztolcman & Domaniewski (1927) and a female deposited in the National Museum of Natural History, Smithsonian Institution, Washington, USA (USNM 159776), was listed as a co-type by Deignan (1961). It is of interest, therefore, to fully document the type material of *M. kalinowskii*.

Material and methods

I visited most of the major natural history museums in Europe and North America and carefully examined all specimens of *Macropsalis kalinowskii*. Specimen label data were compared with the literature, museum registers and archive material where available, and all eight specimens, five males and three females, collected by J. Kalinowski at Pariayacu, near Maraynioc, Peru, were located.

Results and discussion

The original description of *Macropsalis kalinowskii* was based upon the five males and three females, which were supported with data such as locality, collection dates and collector. It was also stated that these specimens were lodged in two private collections, the Musée Branicki in Poland and the Musée Berlepsch in Germany, but the number sent to each collection was not elaborated. The Branickis' collection is now held in the Museum and Institute of Zoology in Warsaw, Poland, and the Berlepsch collection in the Forschungsinstitut und Naturmuseum Senckenberg in Frankfurt am Main, Germany. However, it is clear from the examination of material in each collection that both Berlepsch and the Branickis readily exchanged material with other collectors (see below), and hence the type series is not confined to the museums in Warsaw and Frankfurt.

In the collections housed at the Museum and Institute of Zoology in Warsaw there are three specimens, an immature male with the outer tail feathers still growing and two adult males, all taken at Maraynioc, Peru, by J. Kalinowski and received from the Branickis' collection. Sztolcman & Domaniewski (1927) identified one of these specimens, MZPW 2287, an adult male collected on 12 December 1891, as the type, which therefore was an act of lectotypification. The number on the specimen label is actually 2287P, which is an old registration number, and it has yet to be given a new number. On the Branicki label is the number 2286P, which is obviously an error, as this is the old museum number of the holotype of *Macropsalis lyra peruana*, see Sztolcman & Domaniewski (1927: 106). On Kalinowski's original label is his field number 1573. This specimen is also identified as the type in the museum's card index system. The second specimen, MZPW

23522, is an immature male collected on 26 February 1893, with a Kalinowski field number of 1868. This specimen was sexed as a female on the original museum label and is recorded as a type on the museum card index. The third specimen, MZPW 23517, is an adult male collected on 16 September 1892 and has a Kalinowski field number of 1760. The specimen was originally identified as a type on both the Branicki label and on the museum index card but this has since been crossed out. There appears to have been a fourth specimen in the Branickis' collection, but it is now in the National Museum of Natural History, Smithsonian Institution, Washington, USA, where it was registered as a co-type by Deignan (1961). The term of co-type is no longer recognised under the *International code of zoological nomenclature* (1999), and as a result of the lectotypification by Sztolcman & Domaniewski (1927), the specimen therefore becomes a paralectotype. This specimen, USNM 159776, is an adult female collected above the río Pariayacu (13,120 feet), at the 'Hacienda' Maraynioc, dpto. Junín, Peru, on 6 November 1891, with a Kalinowski field number of 1512.

The other four specimens of the type series appear to originally have been lodged in the Berlepsch collection. However, in the Forschungsinstitut und Naturmuseum Senckenberg in Frankfurt am Main, where the bulk of this collection is now housed, there are only two specimens, both having been sent to Berlepsch by J. Stolzmann in Warsaw, but neither was recorded as types by Berlepsch. As a result, these specimens were also not identified as types by the Frankfurt museum. The first specimen, SMF 29931, is an adult male collected on 6 November 1891, and has a Kalinowski field number of 1511. The second specimen, SMF 29932, is an adult female collected on 5 November 1891, with a Kalinowski field number of 1509.

The remaining two specimens are now in the collection of the American Museum of Natural History, New York (AMNH), where they arrived as part of the Rothschild collection, which was purchased in 1931. Examination of other material in both the Rothschild and Berlepsch collections reveals that these two collectors exchanged many specimens over a period of time and it seems likely that Rothschild obtained these two birds from Berlepsch rather than the Branickis. As mentioned above, Berlepsch failed to record the type status of his series of *Macropsalis kalinowskii* and, as a consequence, neither specimen was identified as a type by Hartert (1922) or by Greenway (1978). The first specimen, AMNH 477023, is an adult male collected at Maraynioc in central Peru on 5 November 1891 by J. Kalinowski and the second, AMNH 477024, is an adult female collected at Maraynioc in central Peru on 26 October 1891 by J. Kalinowski. Neither specimen still has an original Kalinowski field label attached.

Although the type locality was given as Pariayacu, near Maraynioc, central Peru in the original description, the above text reflects what is recorded on the museum and collector's labels. It is unclear where Deignan (1961) obtained the additional locality data for the specimen lodged in the National Museum of Natural History, Smithsonian Institution, Washington, USA. I found no other specimens of

Macropsalis kalinowskii collected by J. Kalinowski in central Peru in any of the museums visited or contacted and believe that the eight specimens discussed above constitute the type series.

Type series of *Macropsalis kalinowskii* Berlepsch & Stolzmann 1894

Macropsalis kalinowskii Berlepsch & Stolzmann 1894, *Ibis* (6) 6, p.399.
Now = *Uropsalis segmentata kalinowskii*, see Peters 1940, p.219.

Lectotype MZPW unregistered, adult male collected at Pariayacu near Maraynioc, dpto. Junín, Peru, 12 December 1891 by J. Kalinowski (field no.1573).
—old museum no.2287P.
—ex Branickis' collection no.2286P (= error).
—for lectotypification, see Sztolcman & Domaniewski 1927, p.107.

Paralectotype MZPW 23522, immature male collected at Pariayacu near Maraynioc, dpto. Junín, Peru, 26 February 1893 by J. Kalinowski (field no.1868).
—ex Branickis' collection.

Paralectotype MZPW 23517, adult male collected at Pariayacu near Maraynioc, dpto. Junín, Peru, 16 September 1892 by J. Kalinowski (field no.1760).
—old museum no.2167C.
—ex Branickis' collection.

Paralectotype SMF 29931, adult male collected at Pariayacu near Maraynioc, dpto.Junín, Peru, 6 November 1891 by J. Kalinowski (field no. 1511).
—ex Berlepsch collection.
—collection locality presumably the same as USNM 159776 (see below).

Paralectotype SMF 29932, adult female collected at Pariayacu near Maraynioc, dpto. Junín, Peru, 5 November 1891 by J. Kalinowski (field no. 1509).
—ex Berlepsch collection.

Paralectotype USNM 159776, adult female collected above the río Pariayacu (13,120 feet) at Hacienda 'Marainioc', dpto. Junín, Peru, 6 November 1891 by J. Kalinowski (field no. 1512).
—ex Branickis' collection.
—for collection locality see Deignan 1961, p.167.

Paralectotype AMNH 477023, adult male collected at Pariayacu near Maraynioc, dpto. Junín, Peru, 5 November 1891 by J. Kalinowski.
—ex Rothschild collection.

Paralectotype AMNH 477024, adult female collected at Pariayacu near Maraynioc, dpto. Junín, Peru, 26 October 1891 by J. Kalinowski.
—ex Rothschild collection.

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Expunging the 'Mascarene starling' *Necropsar leguati*: archives, morphology and molecules topple a myth

by Storrs L. Olson, Robert C. Fleischer, Clemency T. Fisher & Eldredge Bermingham

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Until relatively recently, species of birds known from unique specimens tended to be ignored, often being written off as dubious in one way or another. Because of the rapidity of extinction on islands, however, it is not at all unlikely that a species could be collected and prepared as a museum specimen only once and then become extinct, leaving little or no other trace of its former existence. Careful study of the history of unique specimens and intensive scrutiny of the specimens themselves often leads to a species being fully restored, which has contributed significantly to our knowledge of biodiversity, zoogeography, and evolution (e.g. Graves & Olson 1987, James *et al.* 1989, Olson 1986a,b, Olson *et al.* 1989).

Less frequently, investigations of an unique holotype do not end in such positive results and specimens may turn out to be composites (Olson & Schifter 1989), hybrids (Olson & Violani 1996), or simply mislabelled and misidentified (Olson 1992). The subject of the present study, a supposed Mascarene starling, falls in the last category. This unfortunate relic was trebucheted into ornithological legend by Henry Ogg Forbes, director of the Liverpool Museum (Forbes 1898), in a six-page paper with a colour plate (Fig. 1), line drawing and table. At a time when ornithologists were routinely introducing new species of birds with a descriptions of only a sentence or two, such detail as Forbes advanced might now seem exemplary were it not for the fact that ultimately the entire result is seen to be a fiction.

This single specimen became the focus of one unfounded assumption after another, compounded by some over-vigorous imaginations and lack of any careful subsequent scientific scrutiny, which led to the development of what in hindsight can only be regarded as a myth. With the true identity of this specimen now at hand, its entire written history can be summed up as a banquet of codswallop.

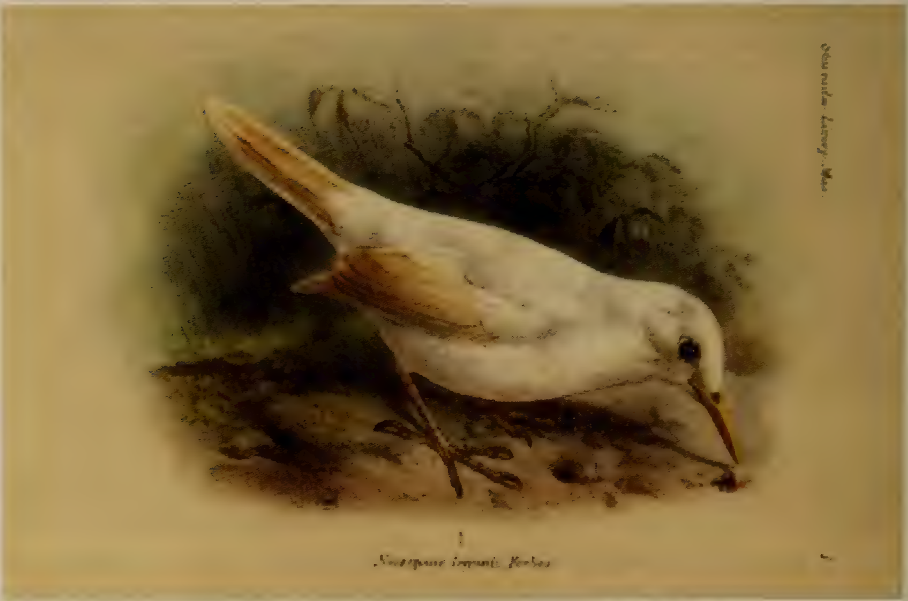

Figure 1. The first published illustration of *Necropsar leguati*, from Forbes (1898)

History

The specimen in question (Liverpool Museum D.1792; Figs. 2–3) was among a mixed lot purchased 10 August 1850 from the dealer Jules Verreaux by the 13th Earl of Derby, whose collection was transferred to the Liverpool Museum in 1851 (Fisher 2002). Its identity was still undetermined when the specimen, then a flat skin, surfaced in an inventory of the collection in 1897. The bird, which was essentially white and had been labelled only 'Madagascar' by the Maison Verreaux, had been placed among bulbuls of the genus *Hypsipetes* (Forbes 1898: 30), one Madagascan species of which is about the same size and of somewhat the same build. Thus the initial tentative placement of the specimen was among the bulbuls, Pycnonotidae. 'That it had been left undetermined for so long a period is probably due to the fact of its being taken for an albino of some species of the above-named genus, or perhaps for a white starling' (Forbes 1898: 30). The last phrase is a non sequitur—if it had been stored among bulbuls, what grounds would there be for assuming that anyone had previously taken it for a starling?

Forbes had evidently reached the conclusion beforehand that the specimen was a starling, and that it had come from the Mascarene islands, so his presentation was weighted heavily towards making the few available facts fit with his preconception. Madagascar is close to the Mascarenes, and the Mascarenes were known to have been the home of two species of starlings. One of these, *Fregilupus varius*, is known historically from the island of Réunion, where it became extinct in the middle of the 19th century (Fuller 2001). This was a showy bird, with large crest and white head and underparts, thus seemingly fitting with the whiteness of Forbes' specimen. The other Mascarene starling is known from fossils from the island of Rodrigues and was named *Necropsar rodericanus* (H. H. Slater in Günther & Newton 1879: 427).

Forbes referred to an anonymous early account, first published by Newton (1875), concerning a bird with white and black plumage, the size of a Blackbird *Turdus merula*, that had been encountered on Islet au Mât (now called Île Gombrani) but not on the main island where the bones of *Necropsar rodericanus* were later found. This account was later attributed to one Tafforet, whose visit to Rodrigues took place in 1725 (Dupon, 1973, Cheke 1987). Île Gombrani is one of a number of small islets within the Rodrigues lagoon that would have provided refugia for the native birds that had been decimated by rats on the main island by 1725. Rats arrived as early as September 1601 during the visit of a Dutch fleet. All the islets are too small to have harboured endemic species and consequently Rodrigues would have had only one species of starling.

Despite the fact that it had no black in the wings and tail, Forbes assumed that the mystery skin was the same species as in Tafforet's anonymous account, and that this had to be different from *Fregilupus varius* because of its lack of a crest, among other things, and from *Necropsar rodericanus* because of the smaller tarsus. He therefore named the specimen from the Derby collection as a new species, *Necropsar leguati*, evidently not wishing to create a new genus for it.

Rothschild (1907: 6), disliking the idea of two starlings existing on Rodrigues, suggested that *N. leguati* was probably an albinistic example of 'the Mauritius species of *Necropsar*'. Mauritius is the only Mascarene island where no starling is otherwise known, and there is not yet a shred of evidence, historical or paleontological, that it ever harboured a starling. Hachisuka (1953), never one to let the lack of evidence stand in the way of naming new taxa, seized upon Rothschild's conjecture and proceeded to create a new genus *Orphanopsar*, with *N. leguati* as its type and only species, although the only difference from *N. rodericanus* that he mentioned was smaller size. Earlier Hachisuka (1937) had gone even further out of bounds in placing the bird observed on Islet au Mât in the Corvidae and naming it as a new genus and species of aberrant chough, *Testudophaga bicolor*, based only on Tafforet's description. This, however, has no relevance to the history of the type of *N. leguati*.

Greenway (1958) was very circumspect and conservative, suggesting that *N. leguati* might be a specimen of *N. rodericanus*, and he listed both in the synonymy of *Fregilupus varius*. Wagstaffe (1978) ventured the opinion that *N. leguati* was a valid species. In the influential Peters Check-list, Amadon (1962: 103) unquestioningly accepted *Necropsar leguati* as a valid species, giving its provenance as 'Met [sic] Islet, off Rodriguez', and suggesting that it was 'possibly identical with *N. rodericanus* Sclater'. This was the received wisdom at least as late as 1987 (Fuller 1987).

The first hint that things might not be as they seemed came from P. J. Morgan, Wagstaffe's successor as Keeper of Vertebrate Zoology at the Liverpool Museum (in Cheke 1987: 49), whose examination of the specimen of *N. leguati* suggested that it 'may not be a starling at all.' This proves to be the case.

Plumage and morphology

As described by Forbes (1898: 34) the specimen of *Necropsar leguati* is 'white everywhere, except for a lighter or darker ferruginous wash on the external webs of the distal half of the primaries and secondaries, as also on the outer webs of the newly moulted, and on both webs of the unmoulted rectrices.' This was repeated verbatim by Hachisuka (1953: 204), as usual without attribution or quotes. In our examination of the specimen, however, it was obvious that the brownish portions of the remiges were asymmetrical from one side of the specimen to the other. Thus we agree completely with Morgan (in Cheke 1987: 49) that the darker portions of the flight feathers are due to 'discolouration'. This staining was evidently an ongoing process, because, as noted by Forbes, the older feathers of the tail are more heavily coloured than the freshly moulted ones, suggesting the bird may have been kept in captivity. In any case, the plumage is entirely white which, with the yellowish bill and feet, which were probably pink in life, leave no doubt that the specimen is an albino. As further evidence of this, the bases of the contour feathers are white, whereas they are dark, for example, in *Fregilupus varius* and *Cinclocerthia*.

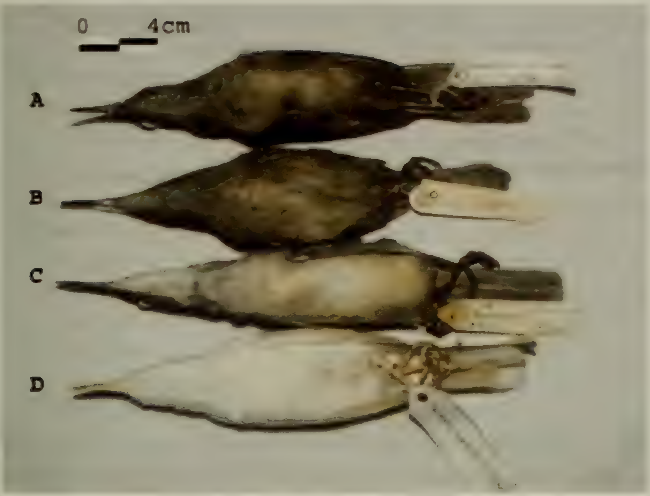

Figure 2. X-radiographs of the skulls in skin specimens in lateral view. A, holotype of *Necropsar leguati* LIV D.1792; B, *Cinclocerthia gutturalis* BMNH 1856.3.12.10 (Martinique); C, *Cinclocerthia tremula* pavida BMNH 1840.5.13.11 (Nevis); D, *Cinclocerthia macrorhyncha* BMNH 1894.12.24.2 (St Lucia); E, *Cinclocerthia ruficauda tenebrosa* BMNH 1898.2.8.21 (St Vincent). Note not only the great similarity of *N. leguati* and *Cinclocerthia*, but also the absence of the ossified posterior border of the nostril that characterises the Pycnonotidae, with which *N. leguati* was first associated.

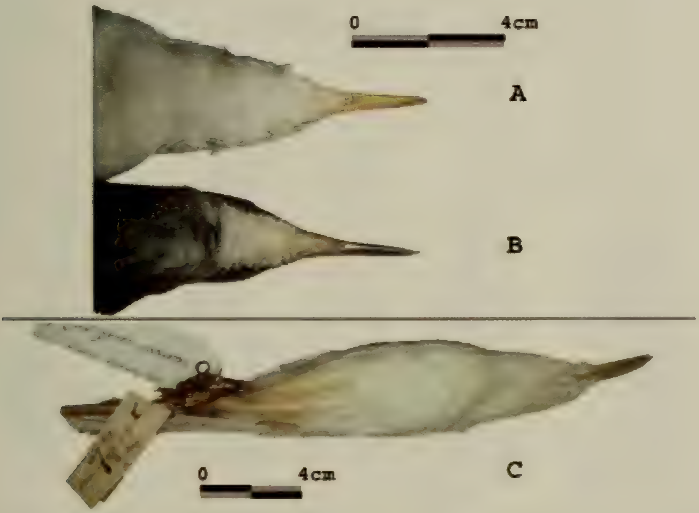

Figure 3. Specimens in ventral view: A, *Cinclocerthia tremula pavida* BMNH 1840.5.13.11 (Nevis); B, *C. ruficauda tenebrosa* BMNH 1898.2.8.21 (St Vincent); C, *C. c. macrorhyncha* BMNH 1894.12.24.2 (St Lucia); D, holotype of *Necropsar leguati* LIV D.1792.

But an albino what? Surely it is not a starling. 'Its wings, however, are quite unlike those of any starling,' as Forbes (1898: 30) himself stated outright. He went on to amplify this further (p. 33): 'It possesses ten primaries, and of these the tenth, or outermost, is not the rudimentary or very reduced quill seen in the *Sturnidae* generally.' It is testimony to his willingness to delude himself that he could continue to rationalise that the bird was somehow nevertheless a starling.

The well-developed outer primary not only establishes that the specimen is not a starling, but also not a member of any of the so-called nine-primaried oscines. Likewise, the wing is not 'short, rounded, and 'concave' as attributed to most of the species of Timaliidae (Newton 1896: 963). The tarsal scutellation (inaccurately depicted by Forbes 1898) is not 'booted' as in the typical thrushes (Turdidae). Bill shape alone eliminates many other groups such as finches, shrikes and flycatching birds. Bulbuls (Pycnonotidae) may be absolutely ruled out by their tiny feet, bill shape and presence of filoplumes in the nape. Furthermore, X-radiographs of the holotype of *N. leguati* (Fig. 2) show that it did not have the posterior margin of the nostril ossified as in the Pycnonotidae (Olson 1990), thus eliminating the family with which the specimen had originally been associated while in Lord Derby's collection.

Through such a process of elimination we were finally led to make detailed comparisons with the species of Mimidae (mockingbirds and thrashers) and here the resemblances became much greater. In size, length and shape of bill, wing formula, and foot structure and scutellation, the holotype of *N. leguati* could be

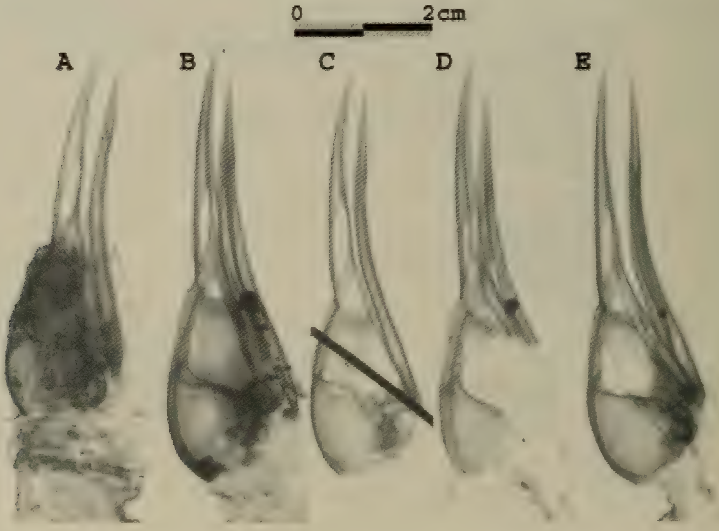

Figure 4. Close-up of ventral view of head (A, B) and lateral view (C) of entire specimen of A, C, holotype of *Necropsar leguati* LIV D.1792; B, *Cinclocerthia macrorhyncha* BMNH 1894.12.24.2 (St Lucia).

matched only by the West Indian thrashers known as tremblers (*Cinclocerthia*) (Figs. 3–4).

The tremblers range throughout most of the Lesser Antilles, from Saba to St Vincent, with six recognised taxa that have usually been considered subspecies of Brown Trembler *C. ruficauda* (e.g. Davis & Miller 1960). However, in a more recent detailed analysis, Storer (1989) advocated recognition of two species, *C. gutturalis* for the populations from Martinique and St Lucia, and *C. ruficauda* for the remainder. Studies of DNA suggest that recognition of even more species may be warranted (see below).

The fact that the holotype of *N. leguati* came from the French establishment of Maison Verreaux suggests the possibility of the specimen having originated in the French islands of Martinique or Guadeloupe. Colour comparisons, of course, are impossible because the specimen is an albino. The various taxa differ among themselves to some extent in size, but our measurements of the specimen of *N. leguati* compared with those in Storer (1989) were inconclusive, partly because there were so few specimens available from the French islands, especially Martinique. So only molecular analysis remained for a finer resolution of the identity of *N. leguati*.

Provenance

As noted, the specimen of *Necropsar leguati* was received from Jules Verreaux and is labelled only 'Madagascar'. Forbes (1898: 30) suggested that because Verreaux had been to the Mascarene islands and had collected a specimen of the Réunion Starling *Fregilupus varius* that he had prepared as a skeleton, that he 'may have also secured' the bird in question during that visit. But then Forbes went on to remark that 'It is well known that M. Verreaux was often very inexact in the precise geographical data he inscribed on the labels of his specimen.' In fact, the unreliability of specimen labels emanating from Maison Verreaux is notorious in ornithology. 'The firm more than once sent out material completely mislabelled' and engaged in deliberately altering the identifications of birds' eggs to increase their market value (Mearns & Mearns 1988: 406). If it is allowed, as Forbes did, that the specimen in question could have come from somewhere other than Madagascar, then there is no basis for picking one locality over another without some sort of corroborating evidence.

We decided to look through some of the other specimens in the Liverpool Museum that came from Verreaux in the same purchase lot as the holotype of *N. leguati,* to see if any of them might shed some light on its provenance (this action being made easier by the existence of a specimen database which could be cross-referenced by date of purchase). We were not disappointed in our expectation of finding specimens with obviously erroneous locality information: a specimen of the North American Virginia Rail *Rallus limicola,* with 'Martinique' crossed out by Verreaux and 'Nle Zelande' (New Zealand) substituted; a *Ptilinopus* fruit dove labelled 'Iles Marquises' annotated by David Holyoak as having an erroneous locality; a specimen of one of the South American subspecies of Southern Rough-winged Swallow *Stelgidopteryx ruficollis* labelled 'Jamaique'; etc.

But the real clincher came when examining a specimen identified as *Foudia madagascariensis* and labelled 'Madagascar'. *Foudia* is a genus of weaver finch (Ploceidae) confined to the south-west Indian Ocean islands. The supposed *Foudia* (D.3185) is a partial albino with the belly, mantle, rump and one rectrix white. The characteristic bill shape, rufous undertail-coverts and coloration of the remaining pigmented parts, however, establish beyond doubt that this is a specimen of the Lesser Antillean Bullfinch *Loxigilla noctis*.

The presence of another albinistic bird endemic to the Lesser Antilles labelled 'Madagascar' in the same purchase lot as the holotype of *Necropsar leguati* is too unlikely to be attributed to coincidence. Verreaux was obviously receiving specimens from the Lesser Antilles from someone, probably an aviculturist, with an affinity for albinos. To these Verreaux proceeded to give what may have been considered a more interesting and exotic provenance.

Mitochondrial DNA

Our comparisons were greatly facilitated by the fact that mitochondrial DNA adenosine triphosphatase subunits 8 and 6 (ATP6/8) had already been sequenced for most relevant taxa of Antillean Mimidae (Hunt *et al.* 2001). Grey Trembler *Cinclocerthia gutturalis* of Martinique was not included in that study, however, for lack of fresh material. Therefore, we obtained samples from a skin specimen of *C. gutturalis* (USNM 75724) and from the holotype of *Necropsar leguati*. We also sequenced part of the mitochondrial cytochrome *b* gene (Cyt*b*) from the same samples of *Cinclocerthia* and *Margarops* (*sensu lato*) as used in Hunt *et al.* (2001).

In April 2000, a small piece of toe pad was sliced with a sterile scalpel from the specimen of *Necropsar leguati* at the Liverpool Museum (D.1792). The sample was placed in a sterile microfuge tube and returned to the ancient DNA laboratory in the Department of Biological Sciences at the University of Durham, where all subsequent molecular analyses of the sample were completed. In February 2001, a small piece of toe pad was sliced with a sterile scalpel from a specimen of *Cinclocerthia gutturalis* (USNM 75724 male, collected by F. A. Ober on Martinique). The sample was placed in a sterile microfuge tube and returned to the ancient DNA laboratory in the National Zoological Park, Smithsonian Institution, Washington DC, where all subsequent molecular analyses of the sample were completed.

Thus, DNA isolations of the two toe pad slices were conducted in separate laboratories on separate continents. Part of each sample was cut into smaller pieces using a sterile scalpel. DNA was isolated from the diced samples using an overnight DTT / SDS / Proteinase K digestion, followed by phenol-chloroform extraction and centrifugal dialysis concentration (Fleischer *et al.* 2000). From 2–4 ml of DNA extract were used in PCR amplifications of specific mtDNA regions for the

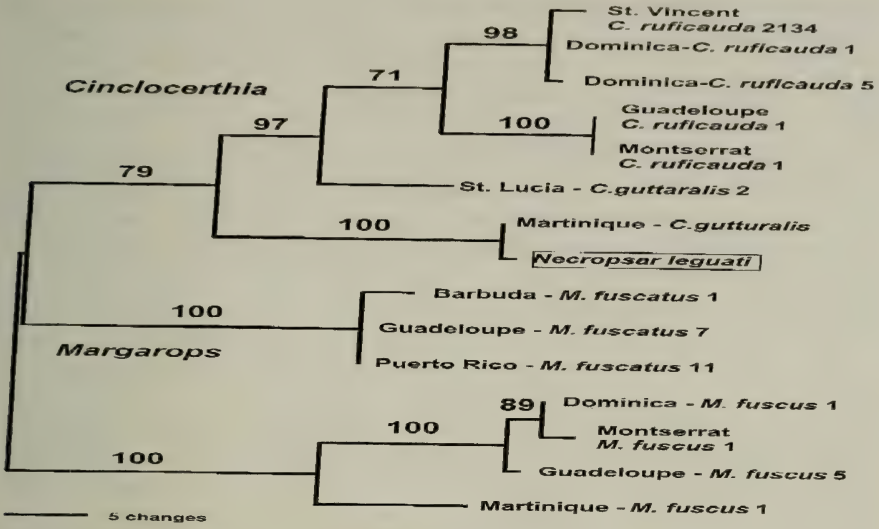
Cinclocerthia
Margarops
98
71
97
79
100
100
100
100
89
100
100
St. Vincent C. ruficauda 2134
Dominica-C. ruficauda 1
Dominica-C. ruficauda 5
Guadeloupe C. ruficauda 1
Montserrat C. ruficauda 1
St. Lucia - C.guttaralis 2
Martinique - C.gutturalis
Necropsar leguati
Barbuda - M. fuscatus 1
Guadeloupe - M. fuscatus 7
Puerto Rico - M. fuscatus 11
Dominica - M. fuscus 1
Montserrat M. fuscus 1
Guadeloupe - M. fuscus 5
Martinique - M. fuscus 1
5 changes

Figure 5. A phylogram of one of two most parsimonious trees found using a branch-and-bound search. The tree length is 135 steps. The numbers at each node are the percentage of 1,000 bootstrap replicates in which the particular node was found, if above 50%. Tree is based on 648 bp of Cytb and ATP8/6 sequence of two museum specimens (Martinique—*C. gutturalis* and *Necropsar leguati*) and Cyt*b* sequences from this paper and ATP8,6 sequences from Hunt *et al.* (2001).

museum specimen samples. We targetted two mtDNA regions: Cyt*b* and ATP8/6. A total of 332 bp of the Cyt*b* region was amplified in two small pieces with primers Cyt*b*1-anc and Cyt*b*.X (112 bp of sequence) and Cyt*b*2.RC and Cyt*b*.wow (220 bp) (Dumbacher *et al.* 2003). Part of the ATP8/6 region was also amplified in two pieces totaling 350 bp with primers A6MNH and t-lys (192 bp; Dumbacher *et al.* 2003) and ATP6R (5'-AGGTGTCCTGCTGTGAGGTT-3') and ATP6L (5'-CCTAGCCTTCCCCCTATGAC-3') (158 bp). Additional *Cinclocerthia* and possible outgroup ATP8/6 sequences were obtained from Genbank, from a deposit by Hunt *et al.* (2001). Additional Cyt*b* sequences were obtained using Cyt*b*1-anc and Cyt*b*.wow on a subsample of the fresh material from Hunt *et al.* (2001). PCR products were cycle sequenced and sized on an ABI automated DNA sequencer. Resulting sequence chromatograms were inspected to ensure correct nucleotide identification. Both strands were sequenced. Sequences were aligned in Sequencher (version 4.1.2; GeneCodes Corporation) to each other and to outgroup sequences.

We obtained a total of 682 bp of mtDNA sequence from *Necropsar leguati* and the Martinique specimen of *Cinclocerthia gutturalis*: 332 of Cyt*b*, 350 of ATP6/8 (Genbank accession numbers pending). The sequences were aligned with each other. The Cyt*b* sequences were identical except for a few ambiguous bases in the specimen of *C. gutturalis*. The ATP8 and 6 sequences were identical between the two specimens, but for a single nucleotide substitution. This low level of sequence divergence strongly indicates that the two specimens are from the same species. We aligned the two museum specimen sequences to the ATP6/8 sequences from Hunt *et al.* (2001) and to the Cyt*b* sequences.

We conducted four different types of phylogenetic analyses on the dataset to reconstruct phylogenetic trees from the sequences: parsimony, neighbour-joining (using a Kimura 2-parameter distance), and maximum likelihood using PAUP* 4.0b10 (Swofford 2002), and a Bayesian analysis using Mr. Bayes 3.0 (Huelsenbeck & Ronquist 2001). We show here one maximum parsimony tree with associated bootstrap values on the nodes (Fig. 5), but note that in all trees produced by any criterion, the specimen of *Necropsar leguati* is a clear and close sister lineage to the specimen of *C. gutturalis* from Martinique. The clade is basal to a *C. ruficauda*/*C. gutturalis* clade, and this is nested within a clade of other Caribbean mimids, including Scaly-breasted Thrasher *Margarops fuscus* and Pearly-eyed Thrasher *M. fuscatus*. Thus, based on both the sequence comparison and the phylogenetic analysis it appears that the holotype of *Necropsar leguati* is an example of *C. gutturalis sensu stricto*, which is known historically only from Martinique.

On the basis of the DNA analysis, one could justify recognising as many as four species of *Cinclocerthia*: *C. tremula* (Lafresnaye 1843) from Guadeloupe, with a subspecies *C. t. pavida* Ridgway (1904, type locality St Kitts) from most of the Lesser Antilles north of Guadeloupe; *C. ruficauda* (Gould 1836) of Dominica, with a subspecies *C. r. tenebrosa* Ridgway (1904) from St Vincent; *C. gutturalis* (Lafresnaye 1843) from Martinique; and *C. macrorhyncha* Sclater (1866) from St Lucia. The distribution of the two basal taxa, *C. gutturalis* and *C. macrorhyncha*, scattered among the seemingly more derived forms, does not match expectation based on linear colonisation of the Lesser Antilles and suggests a rather old split. Such a conclusion requires corroboration from other sources such as nuclear DNA, morphology, and perhaps call and behaviour. Regardless, *Necropsar leguati* clearly belongs with *Cinclocerthia gutturalis*.

Conclusions

On the basis of morphology and the history of the specimen, the holotype of *Necropsar leguati* Forbes, 1898, a supposed Mascarene starling, is shown instead to be a mislabelled albino West Indian trembler of the genus *Cinclocerthia*. Studies of mitochondrial DNA identify the specimen with the distinctive basal taxon from Martinque *C. gutturalis*. These conclusions have the following consequences:

1. *Necropsar leguati* Forbes, 1898, becomes a junior subjective synonym of *Ramphocinclus gutturalis* Lafresnaye, 1843 = *Cinclocerthia gutturalis*.
2. *Orphanopsar* Hachisuka, 1953, becomes a junior subjective synonym of *Cinclocerthia* Gray, 1840.

3. *Necropsar leguati* must now be entirely expunged from the avifauna of the Mascarene islands.

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The type locality of the Hadeda Ibis *Bostrychia hagedash* (Latham)

by W. R. J. Dean

Received 8 November 2003

Bostrychia hagedash was described as *Tantalus Hagedash* by Latham (1790), with type locality Cape of Good Hope (*Caput B. Spei*), very likely from a specimen shot in September 1775 and briefly described by Sparrman (1783, p.293 in the original, pp.280–281 in the English translation). This is not specifically stated in Latham's type description, but the only reference (undated) given therein is to Sparrman's book. The page numbers match the English translation by George Forester (1785).

Latham's description of the type is extremely similar to Sparrman's description of the bird he shot. The locality 'Cape of Good Hope' is vague; although at that time it was generally used to refer to the Cape Peninsula (Cape of Good Hope *sensu stricto*), it may also have been used in a broader sense to refer to the south-western part of South Africa (now the Western Cape Province = Cape of Good Hope *sensu lato*). There is little doubt that Sparrman was the first to record *B. hagedash*—he noted that it was a 'new species of tantalus, called by the colonists hagedash, and also hadelde' (Sparrman 1783: 280). The bird was shot in 'Houteniqualand' (= Outeniqualand), identified by Sparrman as the area between the Great Brak River and Keurbooms River. This is the uplifted coastal plain south-east of the Outeniqua Mountains, with the western edge *c*.375 km due east of the Cape Peninsula. On his travels to the area, Sparrman proceeded to Geelbeksvlei near Mossel Bay, and 'after an excursion in Outeniqualand, went across the 'Attaquas Pass' [33°55'S, 21°58'E, near the Robinson Pass over the Outeniqua Mountains] to the Langkloof' (Rookmaaker 1989: 143). Sparrman apparently camped at Geelbeksvlei, and quite likely shot the 'new species of tantalus' there.

Although Sparrman noted that the bird was common, it is possible that he was referring to its status at Swartkops (Zwartkops) River, near Port Elizabeth, an area that he also visited, and not to its abundance in Outeniqualand. Until the late 1950s *Bostrychia hagedash* was virtually unknown west of Tsitsikama, where it was first recorded in 1959 (Thesen 1959) and subsequently by 1963 at George (Skead 1966), at the start of a rapid spread westwards (Hockey *et al.* 1989). Winterbottom (1968) noted that the species was recorded at that time only from Oudtshoorn (45 km north-west of George), but 'may well occur, at least occasionally, in eastern Mossel Bay'. Within the last 50 years *B. hagedash* has extended its range west and north; it was first noted at Somerset West in the late 1970s and by 1989 had reached Tokai on the Cape Peninsula (Hockey *et al.* 1989). *B. hagedash* is now widely distributed throughout Western Cape Province (Anderson 1997).

The type locality of 'Cape of Good Hope', if used in the restricted sense of referring to the Cape Peninsula, is not compatible with what is known about the distribution of the species in the late 1700s. The locality where Sparrman shot a specimen of *B. hagedash* is not precisely known, but it was not the Cape of Good Hope *sensu stricto*. Although imprecise, it is, however, the earliest published locality at which the species was recorded, not necessarily directly connected to the type description. The type locality of *B. hagedash* should therefore be corrected to the earliest published locality, 'Outeniqualand', which may be further restricted to Geelbeksvlei (34°04'S, 22°04'E), just east of Mossel Bay, and about 40 km west of George.

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First description of the nest of Buff-tailed Sicklebill *Eutoxeres condamini*

by Brian F. Powell

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Buff-tailed Sicklebill *Eutoxeres condamini* occurs in lowland *terra firme* of south-west Colombia and eastern Ecuador and Peru. *Eutoxeres* hummingbirds are members of the hermit subfamily (Trochilidae: Phaethornithinae), whose members lack showy or iridescent plumage. *Eutoxeres* are unique in having stout legs, which are used to cling to *Heliconia* and *Centropogon* flowers, their preferred food sources (Hilty & Brown 1986, Fjeldså & Krabbe 1990). Although several nests of *E. condamini* have been noted in the literature (Fjeldså & Krabbe 1990, Salaman *et al.* 2002), to my knowledge this note constitutes the first detailed nest description.

The occupied nest was discovered on 10 February 1994 in closed-canopy forest at Jatun Sacha Biological Station, 20 km east of Tena, Napo province, Ecuador (01°04'S, 77°36'W, 450 m). The breeding season was previously considered to be perhaps September–November in Peru (del Hoyo *et al.* 1999).

The nest was suspended from a palm leaf of *Prestoea schultzeana burret* (Palmae), 1.2 m above a small stream. The nest was attached to a narrow leaflet, 55 cm long and 3–4 cm wide, and the construction commenced 15 cm down from the petiole (Fig. 1). The nest was 35 cm long, its maximum external diameter 7 cm, cup depth 3.5 cm, inside width of cup 3.2 cm and distance from bottom of cup to bottom of nest 20 cm. It was constructed of mosses, rhizomes and other fine plant materials, giving the nest a dark brown coloration. The cup was lined with course materials resembling palm-leaf pinnules. Woven into the bottom of the nest were small dried leaves (Fig. 1a), which are a common feature of hermit nests (Ruschi 1982, Vigle 1982) and likely assist in disrupting its outline. As with most hummingbird nests, spider webs were used extensively in nest construction, especially around the cup and on points of attachment to the leaf. A unique feature was a strong assemblage of spider webs that originated from the 'tail' end of the nest and were attached to the tip of a nearby leaflet, which held a few plant tendrils and leaves (Fig. 1b).

According to Ruschi's (1982) classification of hummingbird nests, that described here falls into the Type I category, characterised by their elongated shape with a main body that extends into a caudal apex and, in being loosely woven, the eggs or nestlings are visible through the material. Hummingbirds with this type of nests are also found in the genera *Ramphodon*, *Glaucis* and *Threnetes*. The nest described here differed from previously described nests of those genera, and that of congeneric *E. aquila* (Vigle 1982), in having distinct sides extending 8.5 cm from

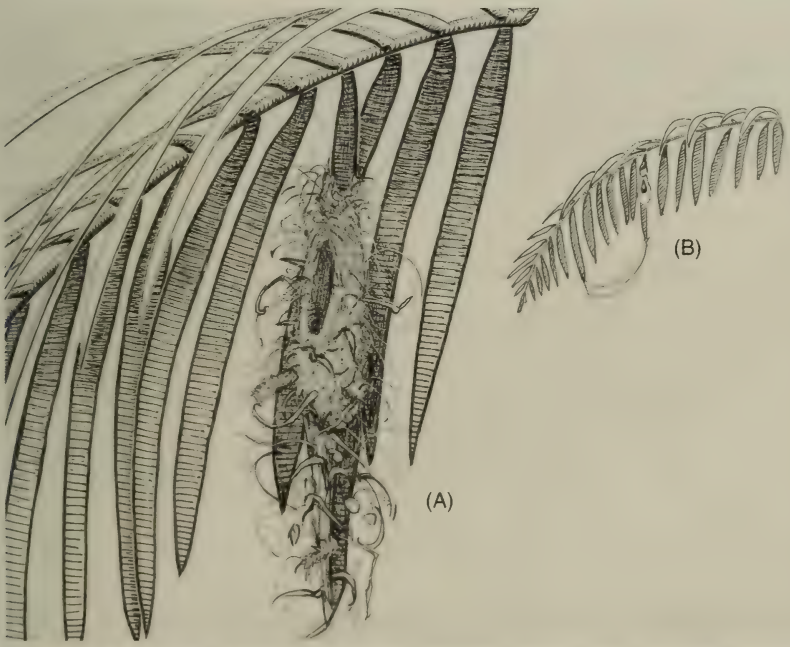

Figure 1. Nest of Buff-tailed Sicklebill *Eutoxeres condamini* showing well-developed overhang above cup, collection of leaves and fine plant materials at the base (a), and attachment to nearby leaflet (b), Jatun Sacha Biological Station, Napo province, Ecuador, 1994.

the cup's rim and culminating in a well-developed overhang (Fig. 1a). The sides and overhang probably offered protection from rain and visual detection by predators; the palm leaflet to which the nest was attached was thin. In contrast, the nest of *E. aquila* described by Vigle (1982), was attached to a broad section of a *Heliconia* leaf that appeared to offer considerable protection.

The nest described here was sited over running water, which is common amongst Neotropical hummingbirds (Davis 1958, Skutch 1964, Haverschmidt 1968, Vigle 1982). A possible reason for nesting over water is that fecal matter can be deposited directly over the side of the nest and carried away by the water. This may be advantageous considering the liquid nature of hummingbird excrement (which cannot be transported in sacs) and its potential for attracting predators.

When I discovered the nest, the adult departed on my approaching to within 2–3 m. The nest contained two recently hatched nestlings. On 13 February, I returned to observe the adult. In 70 minutes of observation, the adult left and returned to the nest six times, but always remained within 20 m of it. During this period the adult perched on the nest for 25 minutes with its bill in a near-vertical position, a characteristic perching posture for hermits with nests of this type (Skutch 1964, Ruschi 1982, Vigle 1982). When I returned on 18 February the nest was unoccupied but was otherwise unchanged.

Acknowledgements

James Norwalk donated his time and expertise for the illustration. Bonnie Bochan graciously offered countless hours of friendship and guidance during my stay at Jatun Sacha, and Steve Herman encouraged this manuscript through his never-ending support of my work. Robert Steidl and Jose Telli provided comments on earlier versions of the manuscript.

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The valid name for the north-west Australian subspecies of the Shining Flycatcher *Myiagra alecto* (Monarchidae)

by Richard Schodde & Edward C. Dickinson

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Since Mees (1982: 134) drew attention to the fact that *Piezorhynchus nitidus* Gould, 1841 was a junior secondary homonym of *Myiagra nitida* Gould, 1838 in *Myiagra*, the north-west Australian subspecies of the Shining Flycatcher, *Myiagra alecto* (Temminck, 1827), has usually been known by the name *melvillensis* Mathews (e.g. Ford 1983, Schodde & Mason 1999, Johnstone 2001). In an anonymous paper, for which authorship was credited later (Mathews 1912b), Mathews (1912a) published that name in the combination *Monarcha alecto melvillensis*, on 2 April 1912, type locality Melville Island. In the same publication, however, he also published *Myiagra rubecula melvillensis* for the Melville Island population of the Leaden Flycatcher *Myiagra rubecula* (Latham, 1802).

Thus, the nomenclature of the Shining Flycatcher is beset with a further problem in secondary homonymy, as appreciated by Mayr (1986: 524), who nevertheless treated *Monarcha alecto melvillensis* Mathews and *Myiagra rubecula melvillensis* Mathews as junior synonyms of other names, and did not assign precedence. Mayr had concluded that the north-west Australian subspecies of the Shining Flycatcher (basionym: *Monarcha alecto melvillensis*) was consubspecific with *Myiagra alecto rufolateralis* (G. R. Gray, 1858, type locality: Aru Islands), a conclusion since shown to be unfounded by detailed analyses of characters in Schodde & Mason (1999).

To resolve the issue of seniority for simultaneously published *Monarcha alecto melvillensis* Mathews, 1912 and *Myiagra rubecula melvillensis* Mathews, 1912, we, acting as first revisers under Art. 24.2 of the *International code of zoological nomenclature* (1999), choose the first name as senior. By this action, that name remains available for the north-west Australian Shining Flycatcher. The latter name, which has never been treated as anything other than a junior synonym of north-west Australian *Myiagra rubecula concinna* Gould, 1848, in post-1950 literature, now becomes junior and invalid whenever the species *alecto* is treated as a member of the genus *Myiagra* (ICZN Arts. 57.3.1, 59.4).

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The taxonomic status of the three subspecies of *Cuculus saturatus*

by Ben King

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Cuculus horsfieldi Moore 1857, *Cuculus saturatus* 'Hodgson' Blyth 1843, and *Cuculus lepidus* S. Müller 1845, were all originally described as species. However, Peters (1940) placed *C. horsfieldi* as a subspecies of *C. saturatus* and *C. lepidus* as a subspecies of *C. poliocephalus* Latham 1790. Wells & Becking (1975) demonstrated that *lepidus* was more closely related to *C. saturatus*, based on its song, which they described and illustrated with sonograms. A classification of *C. saturatus* consisting of three subspecies was generally followed into the 1990s, e.g., by Sibley & Monroe (1990), Howard & Moore (1991) and Wells (1999). However Payne (1997) considered *C. horsfieldi* a species separate from *C. saturatus*, based on differences in their songs, which he described. Clements (2000) followed this split.

The breeding ranges of the three forms of *Cuculus saturatus* are allopatric. *C.* (*s.*) *horsfieldi* breeds across northern Eurasia from north-east Europe to Japan and north-east China. *C.* (*s.*) *saturatus* breeds across the Himalayas, southern China, Taiwan and the extreme northern part of south-east Asia. *C.* (*s.*) *lepidus* is resident in Malaya, and the Greater and Lesser Sunda Islands. *C.* (*s.*) *horsfieldi* and *C.* (*s.*) *saturatus* winter from southern India east and south to New Guinea and Australia. Recent field work and museum study suggests that the taxonomic status of these forms should be revisited.

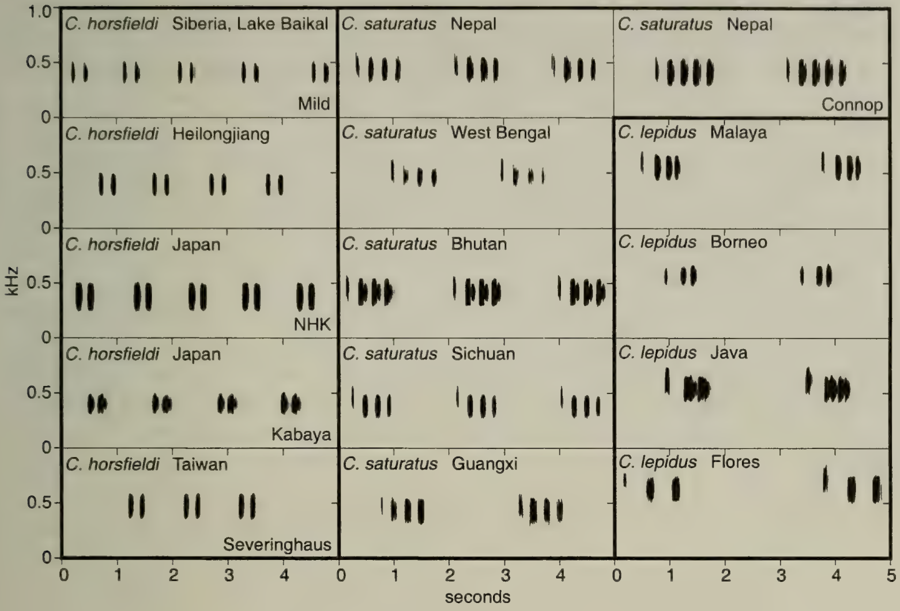

Figure 1. Samples of the territorial songs of *Cuculus* (*s.*) *horsfieldi*, *C.* (*s.*) *saturatus* and *C.* (*s.*) *lepidus* from different parts of their ranges. Note that the song of *horsfieldi* consists of only two equal notes whilst that of *saturatus* has 3–4 equal notes with a higher pitched introductory note. *C.* (*s.*) *lepidus* song differs from *saturatus* song by its higher pitch, with only 2–3 equal notes.

Songs

Wells & Becking (1975) presented a single sonogram for each of the three *C. saturatus* forms (with two for *lepidus*: one from Java and one from peninsular Malaysia), as well as *C. poliocephalus*. They relied on published descriptions to establish the universality of each form's song and concluded that the songs of the three forms of *saturatus* they recognised were sufficiently similar to indicate conspecificity, whilst the song of *C. poliocephalus* was quite distinct.

Herein are presented sonograms (Figs. 1–2) of recently recorded and previously unpublished (mostly) tape-recordings of all four of these forms from different parts of their wide ranges, indicating that the song of each is indeed universal. The much higher pitched song of *C. poliocephalus* is so different that further comparison with the three *C. saturatus* forms is considered unnecessary.

The song of *horsfieldi* is a deep booming couplet *hoop hoop* (occasionally 3–4 notes), the two notes 0.3–0.5 kHz in frequency, *c.*0.14 seconds apart. The call of *saturatus* is composed of 3–4 similar *hoop* notes similarly spaced and pitched, with a shorter introductory *huk* note on a higher frequency (0.35–0.58 kHz). The song of *lepidus* is similar in structure to *saturatus* but the entire song is higher pitched, with only 2–3 *hoop* notes. Most of the energy of the *hoop* notes is above 0.5 kHz (i.e. 0.45–0.70 kHz).

The number of *hoop* notes varies among as well as between individuals in all three forms. David Wells (pers. comm.) states that *lepidus* in peninsular Malaysia produces songs similar to those of *saturatus* and *horsfieldi*, albeit in the *lepidus* pitch range and subordinate to its normal song. Lindholm & Lindén (2003), in a study of *horsfieldi* songs from north-east Europe and across Siberia state that the basic rhythm of its song 'could be described as invariably having bisyllabic phrases', and described several variants. My own field experience with all three forms suggests that, whilst there is variability in the numbers of *hoop* notes and presence or absence of the introductory *huk* note, usage of the 'normal' song as presented in the sonograms and the description above is well over 99%. Thus, each of the three forms of *Cuculus saturatus* has a distinct song, which readily identifies the individual.

Playback experiments *per se* were not carried out. However, in the course of tape-recording, I normally playback the voices of the birds I record to visually ensure the correct identity of the vocalist. Response of *Cuculus* cuckoos varies immensely from none to approaching closely and calling more. In the course of these playbacks, I have never observed a response by a *Cuculus* cuckoo other than the species whose vocalisations were played. This experience indicates that the main function of *Cuculus* songs is intraspecific communication and bolsters the notion of their usefulness as a taxonomic character. It also suggests that playback experiments might be helpful in elucidating *Cuculus* systematics.

The recording of *horsfieldi* from Taiwan by Severinghaus on 29 April is interesting in that *horsfieldi* is not known to breed that far south, yet it was made during the breeding season on that island, and although the date is not too late in spring for the bird to have been en route further north, *Cuculus* cuckoos rarely call away from their breeding areas. This suggests that a reassessment of the taxonomic status of the birds breeding on Taiwan is needed.

Sonograms were made using Canary 1.2.4, the Bioacoustics Workstation of the Bioacoustics Research Program at the Macaulay Library of Natural Sounds at the Cornell Laboratory of Ornithology.

Morphology

The plumage of females is identical to that of males in each of the three forms, except for the brown 'hepatic' plumage phase of some females. The respective plumages of *horsfieldi* and *saturatus* are identical, including the brown 'hepatic'

TABLE 1

Comparison of wing length of adults (presumed accurately sexed) of *Cuculus* (*s.*) *horsfieldi*, *C.* (*s.*) *saturatus* and *C.* (*s.*) *lepidus*. Note that there was no overlap in the sample measured. However, with a larger sample, Robert Payne (pers. comm.) found slight overlap in wing measurements of adult *C.* (*s.*) *horsfieldi* and *C.* (*s.*) *saturatus* of *c.*5%. Measurements in mm; s.d. = standard deviation.

	Male	Female
Cuculus (*s.*) *horsfieldi*		
flattened wing length		
sample size	13	8
mean (range)	203.5 (194–212)	196.9 (186–212)
s.d.	5.7	7.8
Cuculus (*s.*) *saturatus*		
flattened wing length		
sample size	14	5
mean (range)	186.7 (174–192)	177.0 (172–185)
s.d.	4.8	6.4
Cuculus (*s.*) *lepidus*		
flattened wing length		
sample size	14	15
mean (range)	156.2 (147–169)	147.5 (143–152)
s.d.	6.2	3.5

phase females, and there appears to be no way to differentiate them by plumage alone, either in the field or in the hand (Robert Payne, pers. comm.).

Most accurately sexed specimens of *horsfieldi* and *saturatus* can be distinguished by *horsfieldi*'s larger size (i.e. wing length); see Table 1 and Fig. 3. From a larger sample, Robert Payne (pers. comm.) found that 95% of accurately sexed adult specimens could be differentiated.

However, grey phase *lepidus* can readily be differentiated from the grey phase of both *horsfieldi* and *saturatus* by both plumage characters (Table 3) and measurements (Table 1 and Fig. 3). *C.* (*s.*) *lepidus* is overall darker with broader dark bands on the lower breast and belly, and darker, more rusty-buff, undertail-coverts. None of the *lepidus* in the sample overlapped with *saturatus* or *horsfieldi* in wing length, and only a few in culmen length.

'Hepatic' phase female *C.* (*s.*) *lepidus* can be distinguished from 'hepatic' phase female *saturatus* and *horsfieldi* by darker rufous upperparts with broader black barring, and broader black barring on the underparts.

C. (*s.*) *lepidus* also shows a difference in wing formula (see Table 2), with p7 (numbered from the outermost secondary) being second longest and p9 being third longest (usually reversed in *horsfieldi* and *saturatus*), and has a slightly more rounded wing. As both *horsfieldi* and *saturatus* are migratory, a more pointed wing than in resident *lepidus* could be expected and this difference is not presented as having taxonomic significance.

Discussion

The genus *Cuculus* comprises a group of species very much alike in plumage, so much so that they are normally difficult or impossible to differentiate by sight alone, and often difficult to identify even in the hand. They are, however, highly vocal during the breeding season, often seeming to call all day and all night. Each species has a distinctive song that is stereotyped and much the same over its entire range. These species-specific songs enable identification and are an excellent key to their taxonomic status (Payne 1997).

With the larger number of tape-recordings of the three *Cuculus saturatus* forms from a broad sample of their wide ranges now available, it can be demonstrated that, whilst the songs of all three forms are variable, each has a consistent and different 'normal' song, which is that usually heard in the field.

TABLE 2

Comparison of wing formula of *Cuculus* (*s.*) *horsfieldi*, *C.* (*s.*) *saturatus* and *C.* (*s.*) *lepidus*. Note somewhat different wing shape of *lepidus*. Measurements in mm.

	horsfieldi 12 specimens (8 males, 3 females, 1?)	*saturatus* 11 specimens (8 males, 3 females)	*lepidus* 13 specimens (9 males, 3 females, 1?)
Longest primary	8	8	8
Second-longest primary—mean distance from tip (range)	9 (7 once) 9 = 7 (four times) 6.6 (0.0–8.8)	9 (7 twice) 9 = 7 (three times) 8.0 (0.0–10.2)	7 5.3 (3.2–8.0)
Third-longest primary—mean distance from tip (range)	7 (9 once) 7 = 9 (four times) 9.2 (0–11.1)	7 (9 twice) 7 = 9 (three times) 9.5 (0.0–13.3)	9 9.7 (7.1–12.2)
Fourth-longest primary—mean distance from tip (range)	6 24.2 (18.4–29.1)	6 21.7 (19.0–24.0)	6 16.5 (13.1–19.8)
Fifth-longest primary—mean distance from tip (range)	5 40.1 (32.8–46.8)	5 36.6 (25.5–38.9)	5 27.0 (23.3–31.4)

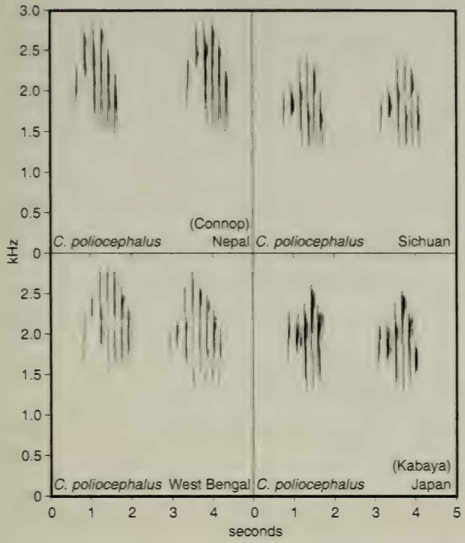

Figure 2. Samples of the territorial song of *Cuculus poliocephalus* from different parts of its range.

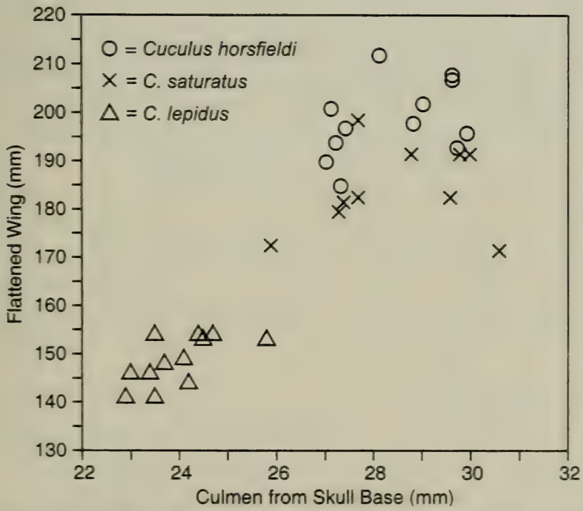

Figure 3. Scatter plot of wing length against culmen length for respective sexes of *Cuculus* (*s.*) *horsfieldi*, *C.* (*s.*) *saturatus* and *C.* (*s.*) *lepidus*. Note that there is no overlap in this sample in wing length between respective sexes of the three forms. However, with a much larger sample, Robert Payne (pers. comm.) found *c*.5% overlap in wing length of respective sexes of *horsfieldi* and *saturatus*. Note also that there is no overlap in culmen length between *horsfieldi* and *lepidus*, but some overlap between *saturatus* and *lepidus*, and nearly complete overlap between *horsfieldi* and *saturatus*.

TABLE 3

Comparison of grey-phase adult *Cuculus* (*s.*) *saturatus* and *C.* (*s.*) *horsfieldi* with grey-phase adult *C.* (*s.*) *lepidus*.

Cuculus (*s.*) *saturatus* *Cuculus* (*s.*) *horsfieldi*	body area	*Cuculus* (*s.*) *lepidus*
dark grey	upperparts of body	dark slaty grey
more, because neck paler	contrast between sides of neck and dark upperwing-coverts	little, because neck darker
pale grey	throat and upper breast	grey
white, often with buffy tinge	base colour of lower breast and belly	pale buffy
*c.*60% of width of pale bands	dark bars on lower breast and belly	almost equal in width to pale bands
buffy	undertail-coverts	rusty buff

Morphologically, *horsfieldi* and *saturatus* differ only in size, with much overlap. However most (*c.*95%) accurately sexed adult specimens can be differentiated by wing length.

C. lepidus differs markedly from *saturatus*/*horsfieldi* in plumage and size, its plumage differing sufficiently to permit field identification of *lepidus* by sight alone, whilst measurements will easily distinguish most, if not all, *lepidus* specimens. In a genus wherein most species are morphologically very close, *lepidus* is conspicuous in its differences from *saturatus*/*horsfieldi*.

The similarity between the songs of *lepidus* and *saturatus* suggest *saturatus* is the closest relative of *lepidus*, whilst the different songs of *Cuculus canorus* Linné 1758, and *C. micropterus* Gould 1837, suggest that they are more distant genetically from *saturatus*. But, morphologically, *canorus, micropterus* and *saturatus/horsfieldi* are quite similar to each other, yet quite distinct morphologically from *lepidus*. I would argue that vocalisations are a better indicator of relatedness than morphology in this case.

It is concluded that the three forms of *Cuculus saturatus* all represent species taxa, based on their distinct songs and different measurements, the case of *lepidus* bolstered by its distinct plumage. The following English names are recommended: Oriental Cuckoo *C. horsfieldi*; Himalayan Cuckoo *C. saturatus*; and Sunda Cuckoo *C. lepidus*.

The distinct song types and measurements of each of the three forms, as well as the plumage differences between *lepidus* and *saturatus*/*horsfieldi* satisfy the diagnosibility requirement of the Phylogenetic Species Concept. Their breeding allopatry will prevent merging in the future. Satisfying the non-interbreeding requirement of the Biological Species Concept is more difficult and involves a judgment call because the three forms are allopatric in their breeding range. However, I would postulate that the distinct calls of these three forms would operate as an effective isolating mechanism if they were to meet on their breeding grounds. DNA studies and possibly playback experiments would help to resolve the taxonomic status of the three forms.

The variation in the vocalisations shown by the sonograms of *C. lepidus* cannot be understood without more data. It will take a study of vocalisations, DNA, measurements and plumage characteristics from a series of individuals from each main island group in the Greater and Lesser Sundas to determine whether *C. lepidus* is one variable species or several.

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Jeff Groth, Mary LeCroy, Robert Payne, David Wells and an anonymous reviewer provided helpful commentary. Jeff Groth prepared the sonograms. John Fitzpatrick and Greg Budney of the Macaulay Library of Natural Sounds at the Cornell Laboratory of Ornithology provided support and the use of tape-recording equipment. The Taiwan *C. horsfieldi* recording by Sheldon Severinghaus is on deposit at the Macaulay Library of Natural Sounds at the Cornell Laboratory of Ornithology; the Nepal *C. saturatus* tape-recording by Scott Connop is on his single cassette *Birdsongs of Nepal*, published by the Cornell Laboratory of Ornithology in 1993; the first Japanese *C. horsfieldi* tape-recording is from a three-cassette collection, entitled *Japanese birds in sound, 100 well-known species*, published in 1971 by NHK TV in Japan; the second Japanese *C. horsfieldi* tape-recording is on a six-CD set by Tsuruhiko Kabaya, *The songs and calls of 420 birds in Japan*, published by Shogakukan, Tokyo, in 2001; the Siberian *C. horsfieldi* by Krister Mild is on his self-published two-cassette *Soviet bird songs* (1987), Stockholm. All of the recordings without a parenthetical recordist were made by Ben King and will eventually be deposited at the Macaulay Library of Natural Sounds at the Cornell Laboratory of Ornithology. All measured specimens are housed at the American Museum of Natural History, New York.

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Confirmation of Buff-fronted Owl *Aegolius harrisii* for the Cordillera Oriental of Colombia

by Sergio Córdoba & Jorge A. Ahumada

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Buff-fronted Owl *Aegolius harrisii* is rare and poorly known. Records come from a variety of habitats and altitudes in Colombia, Brazil, Ecuador, Peru, Bolivia, Uruguay and Argentina (Parker *et al.* 1985, Hilty & Brown 1986, Fjeldså & Krabbe 1990, Studer & Teixeira 1994, König *et al.* 1999). Few specimens are available and the species has been recorded at comparatively few localities.

For Colombia, Buff-fronted Owl has been reported only from 'Bogotá' trade skins from the 19th century (Meyer de Schauensee 1949), from five specimens taken in 1939–72 by Kjell von Sneidern at 1,560–1,860 m, at El Tambo, dpto. Cauca, on the lower slope of the Western Andes, below Cerro Munchique (02°32'N, 76°57'W), and at Llorente, dpto. Nariño, southern Colombia (00°49'N, 77°15'W) (von Sneidern 1954, Fitzpatrick & Willard 1982, Instituto de Ciencias Naturales–Museo de Historia Natural, Bogotá no. 29869). Here we report new distributional information, measurements and weights from four individuals at three localities, two near Bogotá and the third near the Colombian–Venezuelan border (Fig. 1). Data were obtained by personnel from the Laboratory of Population and Community Ecology, Universidad Javeriana, and during biological inventories on the eastern flank of the Cordillera Oriental by personnel from the Instituto Alexander von Humboldt, Bogotá. Birds captured with mist-nets were measured with dial callipers or a millimetre rule (wing chord and tail length), and weighed using an electronic or spring balance. The following records confirm the species' presence in the Cordillera Oriental.

Sites where owls were mist-netted or collected near Bogotá are *c.*15 km west, at Finca San Cayetano, Vereda Fute, municipio Bojacá, dpto. Cundinamarca (04°38'N, 74°19'W), where a male and a female were collected (Colección del Laboratorio de Ecologia de Poblaciones y Comunidades, Pontificia Universidad Javeriana, Bogotá, no. 068, no. 099), and *c.*20 km north-west of the city, at Finca Miralejos, Vereda Pueblo Viejo, municipio Zipacon, dpto. Cundinamarca (04°46'N, 74°24'W), where a female was mist-netted, banded and released. The region is intensively farmed, with remnant forest patches along the west border of the Sabana de Bogotá, at 2,600–2,900 m. Cloud forest fragments of varying size and degrees of disturbance are interspersed with potato, corn and vegetable crops, and dairy cattle pastures. The forest at San Cayetano is part of a larger tract that continues from south-west of Bogotá for *c.*50 km north along the ridge of the Bogotá plateau. Forest at the site is fairly undisturbed, on a gentle slope, with large trees averaging 15 m high, and dense undergrowth. At Miralejos there is a mosaic of small-forest fragments within a matrix of pastures. Forest is similar to that at San Cayetano in height and general structure, although the canopy is discontinuous and there are more signs of recent human and cattle disturbance. Trees and shrubs of the families Asteraceae (*Ageratina* spp., *Erato* spp. and *Eupatorium* spp.), Winteraceae (mostly *Drimis* spp.) and Melastomataceae (*Miconia* spp., *Tibuchina lepidota*, *Bucquetia* spp. and *Clidemia* spp.) are dominant at both sites. Rubiaceae (mostly *Palicourea* spp.), Ericaceae (*Macleania rupestris*) and Melastomataceae (*Miconia* spp.) dominate the understorey, with some Orchidaceae (*Pleurotalis* spp. and *Epidendron* spp.) and Araceae (*Anturium* spp.).

The third site is on the eastern flank of the Cordillera Oriental, in Parque Nacional Natural Tamá, municipio Herrán, dpto. Norte de Santander (07°26'N, 72°27'W), at 2,430 m, within forest with a dense understorey dominated by *Rhipidocladium* plants.

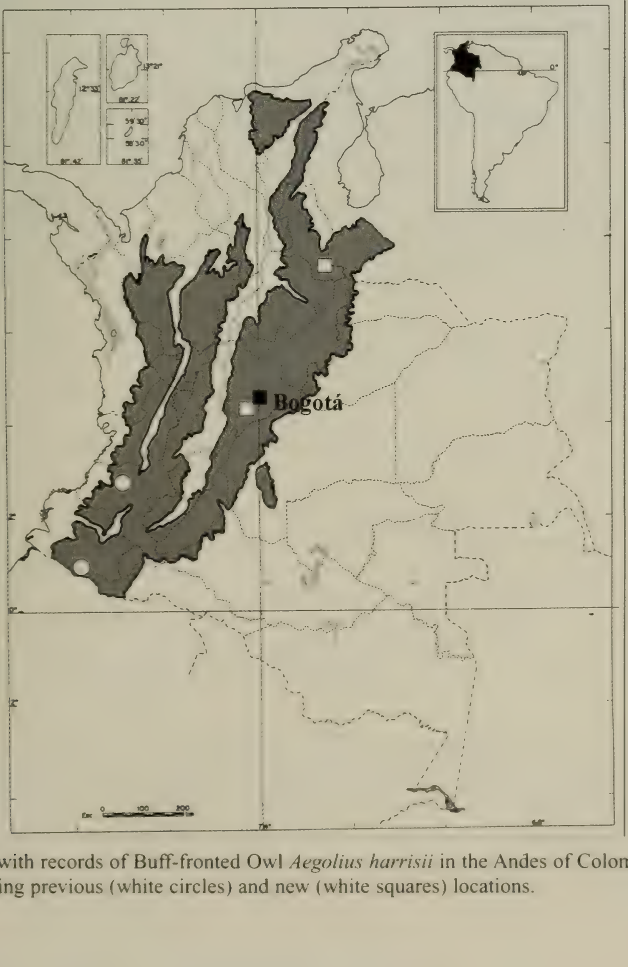

Figure 1. Map with records of Buff-fronted Owl *Aegolius harrisii* in the Andes of Colombia (dark grey shading), showing previous (white circles) and new (white squares) locations.

The two captured at San Cayetano, on 14 October 1998 and 7 December 1998, were possibly a pair and were caught early morning in mist-nets placed within forest. The female captured at Miralejos, on 15 March 1999, was caught at 23.00 h in a mist-net near the forest edge. At both sites mist-nets were placed at ground level. The male specimen collected in Parque Nacional Natural Tamá, on 25 June 1999, was also captured early morning. A headless *Atlapetes* was found in the same mist-net, 50 cm from the owl. This specimen (no. 10636) has been deposited at the Instituto de Investigaciones de Recursos Biológicos Alexander von Humboldt (Villa de Leyva).

All four birds had the bill dusky with a whitish tip, and the feet yellow-flesh. The iris colour of the males was more greenish yellow and that of the females was yellowish green. Measurements and other data for our birds and a 1972 specimen are presented in Table 1. Some mammal hairs were present in the stomach of one of the females (LEP 099).

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Phenotypic status of Red Junglefowl *Gallus gallus* populations introduced on Pacific islands

by A. Townsend Peterson and I. Lehr Brisbin, Jr.

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Following many decades without conservation attention, the genetic integrity of populations of Red Junglefowl *Gallus gallus* populations worldwide has recently become an issue of concern (Brisbin 1996, Peterson & Brisbin 1998, Anon. 2001, Brisbin *et al.* 2002). In general, the concern is that extensive hybridisation with domestic or feral chicken populations is swamping 'wild type' genomes, leading to loss of original genotypes. Numerous phenotypic markers suggest domestic/feral influence, including the presence of white or other atypical colours in the wings, hackles or tail; presence of a comb in hens; absence of eclipse plumages in males; call characteristics; and elongated or exaggerated tail plumes (Peterson & Brisbin 1998, Brisbin *et al.* 2002, Cornwallis 2002), although the relationship between phenotype and genotype can be less than direct (West-Eberhard 2003). Of course, the real challenge is not establishing that particular stocks are *contaminated*, but rather that of finding pure stocks: molecular markers under development (Brisbin *et al.* 2002) and ongoing hybridisation experiments (Brisbin & Peterson in prep.) indicate that *absence* of the above traits is insufficient to indicate genetic purity, but their absence *is* a good indication that populations exhibiting them are not candidate pure populations. If indeed genetically pure Red Junglefowl are rare or even endangered, as we suspect, documentation of the distribution and characteristics of pure stocks becomes key in the conservation of the species and its genome.

As has been emphasised many times previously (e.g. Remsen 1995), natural history museum collections represent the only long-term repository of primary knowledge regarding biological diversity. In the present case, an extensive series (N=87) of birds identified as 'Red Junglefowl' in the collections of the American Museum of Natural History (AMNH), collected between the 1890s (Palmer in Hawaii) and the 1920s and 1930s (Whitney South Sea Expeditions in much of the south-west Pacific) document phenotypes (and potentially genotypes) of this species 80–100 years ago (Ball 1933). We reviewed each specimen in these series' in detail, noting phenotypic traits that differ from the 'wild type' red junglefowl that is well known (Beebe 1926, Delacour 1951, Parkes 1962, Cornwallis 2002), including the following body regions: body feathers (in genetically pure individuals should be all-black in males, mottled brown in females), tail size (should be relatively short and not exceptionally elongated), tail colour (should be all black in males or brown in females), legs (should be slender and dark and not thick and yellow), wing colour (should be all black in males or brown in females), comb (should be small and simple, and not large and elaborate), hackle colour (should be bright orange), spurs (should be relatively small and short), and collar colour

TABLE 1

Summary of phenotypes of Red Junglefowl *Gallus gallus* or feral chickens collected from Pacific islands in the 1890s–1930s, in the collection of the American Museum of Natural History (New York). Traits listed in the right-hand columns are all phenotypic dimensions in which genetic contamination has been noted. Numbers indicate numbers of individuals in the sample showing the particular phenotypic feature.

Island	Year collected	N	Body feathers wrong colour	Tail exceptionally elongated	Legs thick and yellow	White in tail	White in wings	Elaborate comb	Hackles different colour	Elongate spur	Collar wrong colour
Austral Islands, Tubuai	1921	1		1					1		
Caroline Islands, Kusaie	1931	4									
Caroline Islands, Ponape	1930	5									
Fiji Islands, Kambara	1920s	2	1		1					1	
Fiji Islands, Kio	1924	4		2	2			1			
Fiji Islands, Koro	1924	3	2		1			1			
Fiji Islands, Makongai	1924	3	1	1	2	2		2			
Fiji Islands, Taviuni	1924	1	1								
Fiji Islands, Vanua Mbalava	1924	2	2			1					
Hawaiian Islands, Kauai	1891	5	5	2	4	1	1		2		
Marquesas Islands, Eiau	1922	2	2	1	2	1					
Marquesas Islands, Hivaoa	1922	4	3	2	3	1			3		
Marquesas Islands, Motane	1922	1		1	1	1					
Marquesas Islands, Nukahiva	1921, 1922	3	3		1						
Marquesas Islands, Uahuka	1922	5	5	1	1	1					4
New Guinea, NE coast, Long Island	1933	3	2		1	2					
New Hebrides, Efate Island	1926	8	4	4	4	1		1	1		
Society Islands, Moorea	1921,1924	16	6	1	4		2	2	4		
Society Islands, Raiatea	1922	2	1								2
Society Islands, Tahiti	1921	11	1	1	2		3		4		
Tonga Islands, Ala	1925	2	1	1	1	1					

(should be black in males or brown in females). Here, we briefly present the results of our review of these series of specimens.

In general, both the Whitney and Palmer series appear to document extensive genetic contamination of junglefowl stocks on Pacific islands (Table 1). Indeed, every individual from every island showed clear evidence of domestic influence in at least one phenotypic trait examined, as had been noted in a previous review of the Whitney material (Ball 1933). The exception among the AMNH specimens, interestingly, are those collected in the early 1930s on the Caroline Islands: no individual from this series (N=9) showed indications of genetic contamination.

Given that our ongoing experiments (Brisbin *et al.* 2002) indicate that phenotypic markers are poor indicators of absolute purity (i.e. even moderate levels of genetic contamination can prove undetectable via phenotypic markers), the Caroline Island populations deserve closer examination. The specimens available are at least as pure phenotypically as those present in the native distributional areas in the same era (Peterson & Brisbin 1998, Brisbin *et al.* 2002). As no recent Caroline Island specimens have been located in our surveys of other natural history museum collections, investigation of the present-day integrity of these populations would be a priority.

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A review of the type material of the Oilbird *Steatornis caripensis*

by Nigel Cleere

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The Neotropical Oilbird *Steatornis caripensis* von Humboldt, 1817 is the sole member of the family Steatornithidae, which is placed either within the Caprimulgiformes (e.g. Peters 1940, Cleere 1998, Thomas 1999, Holyoak 2001) or the Strigiformes (e.g. Sibley *et al.* 1988, Sibley & Ahlquist 1990, Sibley & Monroe 1990). Described from Caripe caves in north-east Venezuela by von Humboldt (1814), it has long been regarded as a monotypic species, although a smaller, southern race was described from northern and central Peru by Taczanowski (1884). The Peruvian form was subsequently found to be indistinguishable from birds from Trinidad and from Bogotá trade skins (Zimmer 1930).

The species has been reasonably well studied since its discovery (e.g. Snow 1961, 1962, Roca 1994), but little has been published on its taxonomy or nomenclature, and the only recent data appears to be my own (Cleere 2002). Here, I now comment on the Oilbird's type material.

Materials and methods

I visited most of the major natural history museums in Europe and North America and carefully examined all Oilbird specimens. I also compared their data with the literature, museum registers and archive material where available.

Results and discussion

Steatornis caripensis was described from the Caripe caves in north-east Venezuela by von Humboldt (1814), who mentioned that two birds were obtained by his colleague, A. Bonpland, on or shortly after 18 September 1799. Presumably, these two would eventually have been regarded as types, but following collection their whereabouts remained a mystery for several years. The earliest report on the fate of these specimens appears to have been that of L'Herminier (1834), who revealed that having been dispatched to Europe, they were lost in a shipwreck off the coast of West Africa in 1801.

Since its discovery, only one other form of Oilbird has been described, named *Steatornis caripensis,* var. *peruviana* by Taczanowski (1884), who presented a full account of birds found in northern and central Peru (see below), and also highlighted plumage differences compared to Venezuelan birds. No type data were given, but localities where the new race was said to occur were listed as Tingo Maria, dpto. Huánuco (Raimondi), Cajamarca and Pumamarca, dpto. Junin (Jelski), Ninabamba and Querocotillo, dpto. Cajamarca (Stolzmann) and la vallée

Huayabamba, dpto. Amazonas (Stolzmann). (Names in brackets refer to those persons who supplied information or specimens to the author, who never travelled to Peru himself.) Supporting the description of this new Oilbird was a series of notes on the habits of this species at Ninabamba, written by J. Stolzmann. In one passage, Stolzmann refers to an incident in which 60 shots were fired to bring down 11 birds, although not all were recovered and the precise number preserved as museum specimens was not given. The specimens were initially sent to the Zoological Cabinet in Warsaw, Poland, which was formerly part of the Royal University of Warsaw, and then later to the Branickis' collection, also in Poland (Kazubski 1996). However, prior to their transfer to the Branickis' collection, one specimen had already been sent to Count Berlepsch's collection in Germany (see below). The Branickis' collection was subsequently transferred to the Museum and Institute of Zoology in Warsaw, Poland (MZPW), and the Berlepsch collection to the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany (SMF). No data on specimens collected at the other localities were given.

Prior to his description of the Oilbird found in Peru, Taczanowski published two short accounts of the material collected (see above). In the first, he confirmed that several specimens had been collected on 4 July 1879 in a cave situated at 7,100 ft (*c.*2,160 m), at Ninabamba, Chota province, Santa Cruz district, in dpto. Cajamarca, on the west slope of the Andes (Taczanowski 1880). In the second, he simply recorded that two specimens were collected in February 1880 at Huambo (Taczanowski 1882).

The first documentation of the type material of *Steatornis caripensis peruvianus* was by Taczanowski (1889). In this work, the author listed as types a male and female labelled 10878 (an old catalogue number?), and referred to two other specimens not included in the inventory, but obtained by Stolzmann in Ninabamba and Huambo. In a later type catalogue of birds in the Museum and Institute of Zoology in Warsaw, Poland, only one specimen was listed (Sztolcman & Domaniewski 1927). This was recorded as MZPW P.2300, an adult male collected 4 July 1879 at Ninabamba, north-east Peru, by J. Stolzmann, which can now be accepted as an act of lectotypification under the International Commission on Zoological Nomenclature (ICZN) (1999) art. 74.1. The specimen is recorded as the type on the museum index card, although the writing differs to that on the museum label.

A second specimen housed in the Museum and Institute of Zoology in Warsaw, Poland is recorded as a co-type, a term no longer recognised by the ICZN. This specimen is unregistered (=MZPW 1453?), and is an unsexed bird collected 24 February 1880 at Huambo, Peru, by J. Stolzmann. Although regarded as a co-type on the museum index card, the entry is in a different ink and handwriting to the type, and was possibly added to the museum records at a later date. A third specimen present in the Museum and Institute of Zoology in Warsaw, Poland, but not recorded as a type in the museum's records, is MZPW 23912, an adult female also collected 4 July 1879 at Ninabamba, north-east Peru, by J. Stolzmann. This specimen appears to have been registered on the museum index card at the same time as the lectotype (i.e. same handwriting) and is probably a paralectotype. A fourth specimen in the Museum and Institute of Zoology in Warsaw, Poland, is MZPW 23914, an undated adult female collected at Huambo by J. Stolzmann. This specimen was formerly in the Branickis' collection, where it had a collection number 924c and was labelled as a type. I believe that these four specimens are the ones referred to by Taczanowski (1889).

In the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany (SMF), there is a specimen that was formerly in the Berlepsch collection, which he received from Taczanowski in Warsaw in October 1880. This specimen is registered as SMF 29967, and is an adult male collected 4 July 1879 at Ninabamba, north-east Peru, by J. Stolzmann. Although this specimen was sent to Germany prior to the description of the Peruvian Oilbird and its types were published, it was clearly part of the original series used to establish the new form, and I therefore have no hesitation in accepting that it is probably also a paralectotype. As a result of my investigations, I believe that the synonymy and types of the Oilbird may be given as follows.

Steatornis von Humboldt, 1814

Steatornis von Humboldt F. H. A., 1814, *in* von Humboldt F. H. A. & Bonpland A. J. A., *Voy. Nouv. Cont.* Pt. 1, Vol. 1, p. 416.

For citation, see Cleere, N. 2002, *Bull. Brit. Orn. Cl.* 122, p. 71.

Type, by monotypy, 'Guacharo' = *Steatornis caripensis* von Humboldt F. H. A. 1817.

Steatornis caripensis von Humboldt, 1817

Steatornis caripensis von Humboldt F. H. A., 1817, *Bull. Sci. Soc. Philom. Paris,* p. 52.

Two probable syntypes collected c.18 September 1799 at Caripe cave, Monagas, north-east Venezuela by A. Bonpland. Lost at sea off the coast of western Africa in 1801, see L'Herminier 1834, p. 321.

Nyctibius steatornis Stephens J. F., 1826, *in* Shaw G., *Gen. Zool.* 13, Pt. 2, Aves.

Published as *Ny ? steatornis*, a new name for the erroneous *Caprimulgus steatornis* Humboldt.

For date of publication, see Mathews G. M. 1919, *Birds of Australia*, vol. 7, p. 467.

Steatornis caripensis peruvianus Taczanowski L., 1884, *Orn. Pérou*, vol. 1, p. 199.

Published as *Steatornis caripensis*, var. *peruviana*, but see ICZN (1999) Art. 30.1.2 and Art. 45.6.4.

Lectotype MZPW unregistered, adult male, relaxed mount, collected 4 July 1879 at Ninabamba, Cajamarca, Peru, 7,100 ft (c.2,160 m), by J. Stolzmann. Old museum no. MZPW 2300 P. For lectotypification, see Sztolcman & Domaniewski 1927, p. 107.

Paralectotype MZPW 23912, adult female, relaxed mount, collected 4 July 1879 at Ninabamba, Cajamarca, Peru, 7,100 ft (c.2,160 m), by J. Stolzmann.

Paralectotype SMF 29967, adult male, collected 4 July 1879 at Ninabamba, Cajamarca, Peru, 7,100 ft (c.2,160 m), by J. Stolzmann. Ex Berlepsch collection—received October 1880 from L. Taczanowski in Warsaw.

Paralectotype MZPW unregistered (=MZPW 1453?), adult, collected 24 February 1880 at Huambo, Amazonas, Peru, by J. Stolzmann.

Paralectotype MZPW 23914, adult female, collected February 1880 (probably on 24th) at Huambo, Amazonas, Peru, by J. Stolzmann. Ex Branickis' collection no. 924c.

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Two unreported specimens of Ochre-breasted Pipit *Anthus nattereri* from a new Brazilian locality

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Ochre-breasted Pipit *Anthus nattereri* is a rare species of grassland and open, low *cerrado* in southern Brazil, eastern Paraguay and north-east Argentina (Collar *et al.* 1992, Ridgely & Tudor 1989). BirdLife International (2000) classified the species as Vulnerable because of range reduction associated with habitat destruction and changes in fire and grazing regimes (see Parker & Willis 1997). Collar *et al.* (1992) listed just 18 historical localities in Brazil for this pipit, although recent research has yielded a few additional sites (e.g. Silveira 1998).

We describe here two unreported male specimens from the bird collection of the Field Museum of Natural History (FMNH), Chicago, USA, collected by Emmet R.

Blake in November 1937 and previously mislabeled as Hellmayr's Pipit *Anthus hellmayri*.

We found the diagnostic characters mentioned by Hellmayr (1921, 1935) in both specimens (FMNH 110977 and FMNH 110979). The feet have a long posterior toe and a long, relatively flat posterior claw. The toe and claw combined measure 26 mm and 28 mm in the two males. The bills lack the dark tip of *hellmayri* and the tail shapes are different. Both specimens have a yellowish-ochre coloration to the head and breast, typical of *nattereri*, but this is a less obvious character.

The collection locality is Fazenda Morungaba, Paraná state, Brazil, at an elevation of 600 m. According to Paynter & Traylor (1991) the coordinates of this fazenda are 24°10'N, 49°20'W. Blake also collected five specimens of Hellmayr's Pipit *Anthus hellmayri* at Fazenda Morungaba in the same period. These specimens are referable to the subspecies *brasilianus* (see Voelker 1999 for the probable specific status of this form). *A. nattereri* and *A. hellmayri brasilianus* occur sympatrically at other sites in Brazil and Argentina (Silveira 1998, Fraga 2001).

According to F. C. Straube (pers. comm.), there are no specimens of *A. nattereri* in the main ornithological collection of Paraná state (Museu de Historia Natural Capão da Imbuia). Collar *et al.* (1992) listed only two previous localities for *A. nattereri* from Paraná, based on specimens taken in 1907 and 1922 at Fazenda Monte Alegre and Invernadinha. These two localities (plus our own) cover a linear distance of *c.*255 km across the eastern highlands of the state, with an elevational range of 600–1,065 m, where a mosaic of grasslands and forest is a conspicuous landscape feature. The highlands of eastern Paraná still possess extensive areas of native grassland (*campos gerais*) that could support this pipit, and visiting ornithologists are advised to search for the species. The months of all the Paraná specimens (May, August and November) suggest its residency there, as reported elsewhere for this pipit (e.g. Fraga 2001). The specimens reported here augment our scant information on the former distribution and history of the species.

Acknowledgements

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A new genus for the Mongolian Finch *Bucanetes mongolicus* (Swinhoe, 1870)

by Guy M. Kirwan & Steven M. S. Gregory

Received 10 April 2004

The so-called 'desert finches' represent a generally recognised, if only broadly aligned, grouping of four species found in the Western Palearctic and Western and Central Asia. They are: Crimson-winged Finch *Rhodopechys sanguineus* (Gould, 1838) of north-west Africa (*R. s. alienus* Whitaker, 1897) and Turkey and the Levant east to Central Asia (*R. s. sanguineus*); Desert Finch *Rhodospiza obsoleta* (Lichtenstein, 1823) in the Levant east to Inner Mongolia (monotypic); and the two species of 'trumpeter' finches, Trumpeter Finch *Bucanetes githagineus* (Lichtenstein, 1823), which comprises four subspecies found discontinuously from the Canaries to Central Asia and north-west India, and Mongolian (Trumpeter) Finch *B. mongolicus* (Swinhoe, 1870) of Turkey east to western China (monotypic). The genera *Rhodopechys* Cabanis, 1851, and *Rhodospiza* Sharpe, 1888, are rarely challenged in the most-modern literature (the use of all three genera was first widely promulagated by Hartert & Steinbacher 1938), although Desert Finch, the sole representative of the latter genus is sometimes regarded as a constituent of *Rhodopechys* (see below). Of particular debate is the generic assignment of the other two species, which is further discussed here. It has recently been suggested that *Rhodopechys sanguineus alienus* might represent a phylogenetic species, distinct from nominate *sanguineus* (Fry & Keith 2004). As is partially visible in the accompanying photos, the two are rather distinct in adult male plumage and GMK, at least, favours the theory that the two are probably allospecies (Kirwan &

Atkinson in prep.). This issue is beyond the scope of the present contribution, however, and will be addressed elsewhere.

Treatment in the literature

As part of an ongoing field, museum and literature study into the distribution and taxonomy of Turkish birds (Kirwan *et al.* in prep), the first-named author revisited the question of the most appropriate genus in which to treat the two species of 'trumpeter' finches. Two existing options appeared available, to consider them both as *Bucanetes* or to subsume them, and perhaps *Rhodospiza*, within *Rhodopechys*. Initially, he took a sample of some of the existing and more modern literature, including field guides. Literature was solely selected on the basis of material available in his library that covered at least three of the four species, and which did not strictly follow another previously accessed source for taxonomy and nomenclature. Eleven publications treated all of the 'desert finches' within an expanded *Rhodopechys* (Vaurie 1949, Ripley 1961, Vaurie 1972, Ali & Ripley 1974, Hüe & Etchécopar, Cheng Tso-hsin 1987, Sibley & Monroe 1990, Clement *et al.* 1993, Sibley 1996, King 1997, Adamian & Klem 1999) and the others, 14, considered the group to comprise three genera (Voous 1977, Flint *et al.* 1984, Roberts 1992, Beaman 1994, Baumgart 1995, Roselaar 1995, Inskipp *et al.* 1996, Porter *et al.* 1996, Beaman & Madge 1998, Grimmett *et al.* 1998, Snow & Perrins 1998,

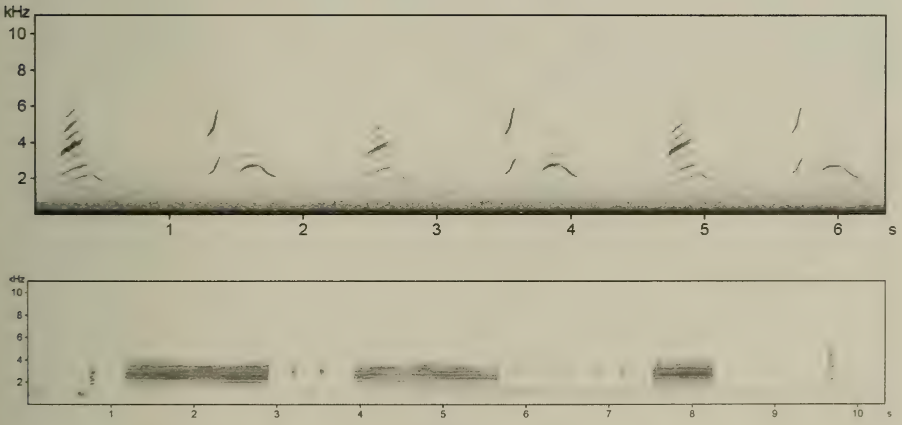


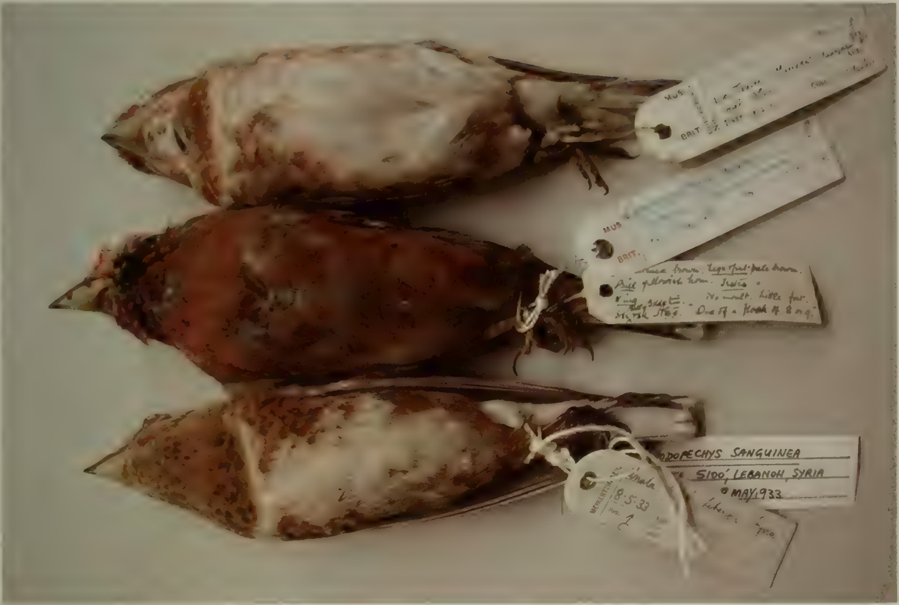
Figure 1. Sonograms of Mongolian Finch *Bucanetes mongolicus* (upper, recorded near Xining, Qinghai province, in western China, in June 1993, by Paul Holt, using a Sony TCM 5000EV cassette recorder, Sennheiser ME88 + pre-amp.), and Trumpeter Finch *B. githagineus* (lower, recorded near Ouarzazate, Morocco, in March 1978, by Claude Chappuis, using a Grampian DP microphone, Nagra SN tape-recorder and parabola). Sonograms prepared by Richard Ranft (The British Library National Sound Archive, London, UK) using Avisoft software, with standard default settings. Recordings © of the recordists.

Svensson *et al.* 1999, Dickinson 2003, Fry & Keith 2004). From this, distinctly unscientific but probably broadly accurate sampling of the different treatments, it seemed that there was an increasing tendency for the four species to be treated in three genera, and therefore for *Bucanetes* and *Rhodospiza* to be recognised. (It should be noted that if included within *Rhodopechys*, the specific name of the Mongolian Finch remains *mongolicus*, whilst if treating Trumpeter Finch similarly its name must be spelled *githagineus*: David & Gosselin 2002, and not as in Howell *et al.* 1968).

The relationship of *B. mongolicus* to *B. githagineus*

Although generally accorded specific status, Mongolian Finch was considered a subspecies of Trumpeter Finch by Dementiev & Gladkov (1966–70) and Cheng Tso-hsin (1976, 1987), an arrangement that is clearly untenable given the suggestion of Panov & Bulatova (1972) that *mongolicus* is more closely related to Scarlet (Common) Rosefinch *Carpodacus erythrinus*, and, even more importantly, because the two are broadly sympatric without interbreeding (e.g. Vaurie 1949). East in Asia, *mongolicus* and *githagineus* are also apparently altitudinally segregated (Haffer 1989), but further west, e.g. in Turkey and the Caucasus, they have been, at least occasionally, recorded in total sympatry (see Roselaar 1995, Kirwan *et al.* 2003), and some evidence of character displacement has been noted (in greatest detail by Panov & Bulatova 1972), which is a phenomenon frequently observed among relatively closely related species in areas where they overlap. They also differ markedly in vocalisations, see Fig. 1 for sonograms of their principal song-types. Given such striking differences in the latter, we (like others) prefer to drop the 'trumpeter' modifier from the vernacular name of *B. mongolicus*.

With hindsight, in some respects it was rather perceptive of Swinhoe to have described Mongolian Finch within *Carpodacus* given that the species' coloration and behaviour, especially courtship, shows much greater similarity with the latter genus than to the other *Bucanetes* (GMK pers. obs.). Cabanis (1851) described the genus *Bucanetes* thus (translated from the German): 'Satisfactorily distinguished from *Carpodacus* by the longer, more pointed wing and the shorter tail, as well as by the less broad bill, tighter feathering and coloration'. In some of these characters, *B. mongolicus* also differs from *Carpodacus*, but clearly, as the characterisation of a genus, such a description leaves much to be desired and does not provide compelling rationale for the inclusion of other species taxa therein. Additionally, E. N. Panov (*in litt.* 2003) and Panov & Bulatova (1972) reported that unpublished work on the vocalisations of *C. erythrinus* and *B. mongolicus* also appears to support the idea of a close relationship between the two. To transfer either of the two 'trumpeter finches' to *Carpodacus* (as was done by Ripley 1982) is unsupported by all of the available evidence, although the caryotypes (Panov & Bulatova's work somewhat pre-dates currently fashionable DNA analyses) of *mongolicus* and *erythrinus* are rather similar and both differ more significantly from *githagineus*


MUS. BRIT.
RHODOPECHYS SANGUINEA
SIDO', LEBANON, SYRIA
8 MAY 1933
8.5.33

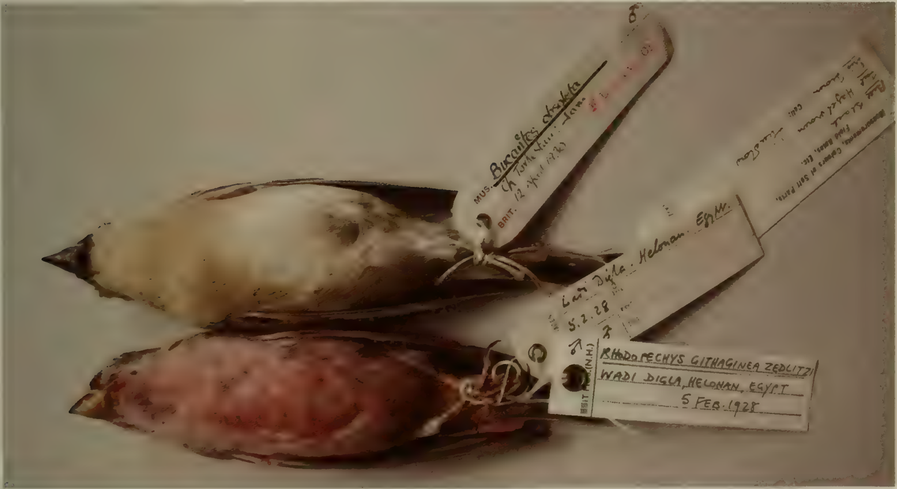
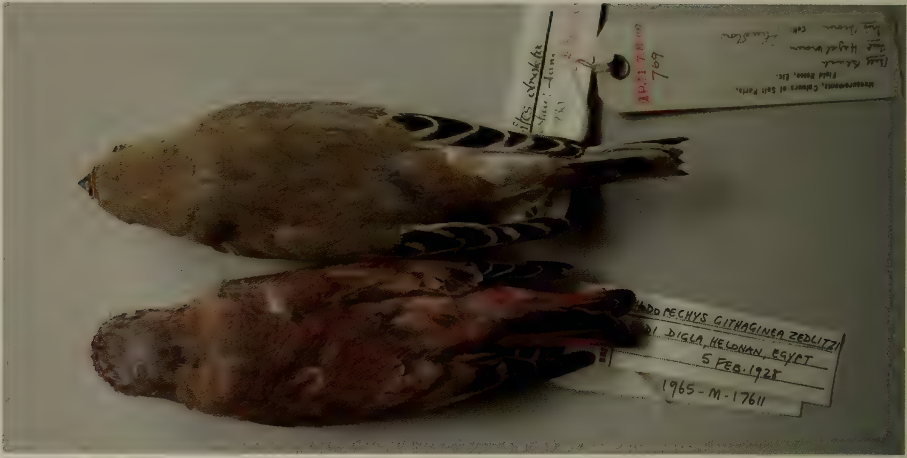
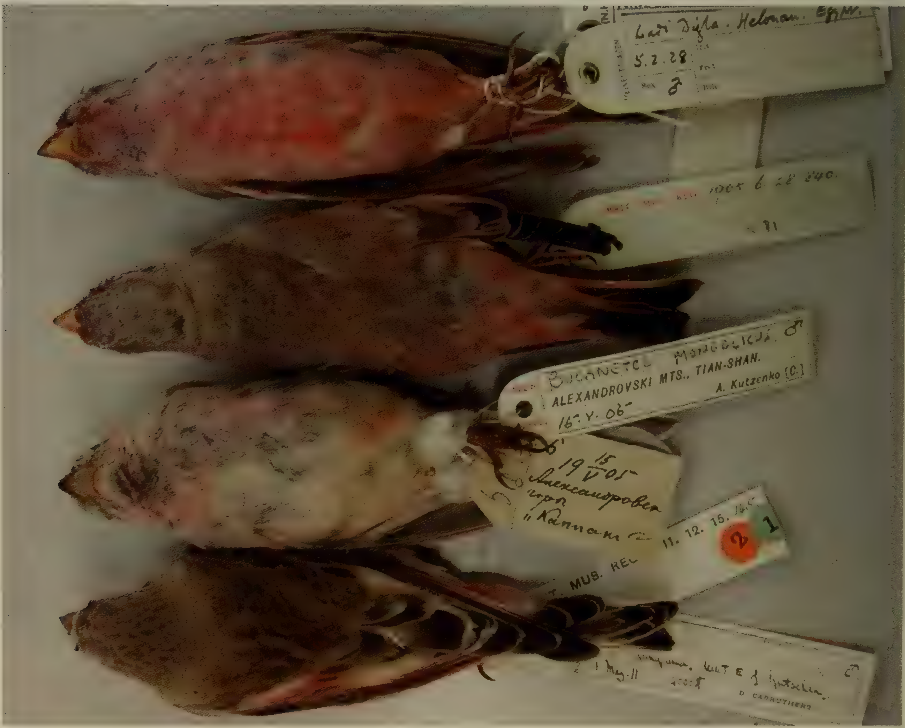

MUS. BRIT.
Wadi Digla. Helouan. Egypt.
5.2.28
RHODOPECHYS GITHAGINEA ZEDLITZI
WADI DIGLA, HELOUAN, EGYPT
5 FEB. 1928

Figure 2 (top). Specimens of 'desert finches' (from top to bottom): Crimson-winged Finch *Rhodopechys sanguineus alienus*, Red-browed Finch *Callacanthis burtoni*, and Crimson-winged Finch *R. s. sanguineus* (Guy M. Kirwan, © the Natural History Museum, Tring)

Figure 3 (bottom). Desert Finch *Rhodospiza obsoleta* (top) and Trumpeter Finch *Bucanetes githagineus zedlitzi* (Guy M. Kirwan, © the Natural History Museum, Tring)


ADOPECHYS GITHAGINEA ZEDLITZI
DI DIGLA, HELONAN, EGYPT
5 FEB. 1928
1965-M-17611
709


Wadi Digla. Helonan. Egypt
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Bucanetes mongolicus ♂
ALEXANDROVSKI MTS., TIAN-SHAN.
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Figure 4 (top). Dorsal views of the same specimens as in Fig. 3 (Guy M. Kirwan, © the Natural History Museum, Tring)

Figure 5 (lower). Mongolian Finches *Bucanetes mongolicus* (lower two birds) and Trumpeter Finches *B. githagineus* (Guy M. Kirwan, © the Natural History Museum, Tring)

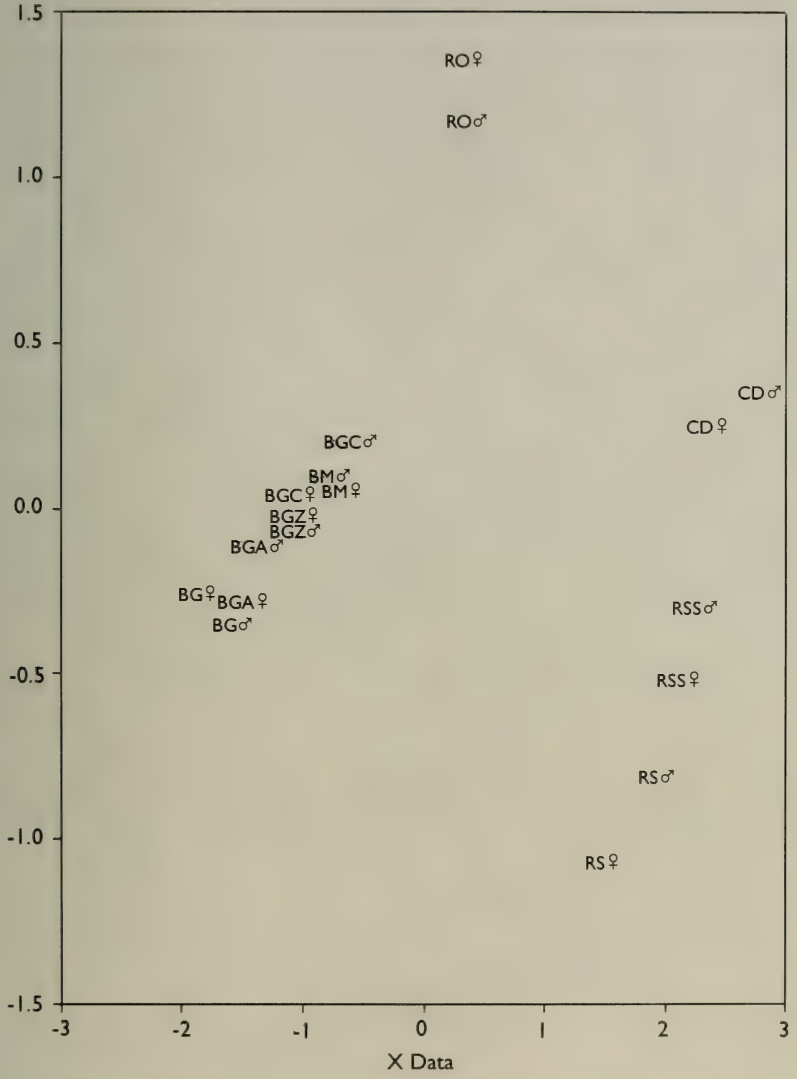

Figure 6. Results of a Principal Components Analysis for wing, tail and bill (culmen) lengths of all taxa of 'desert finches' plotted two dimensionally. BG = *Bucanetes githagineus githagineus* (12 males, three females), BGA = *B. g. amantum* (seven males, seven females), BGC = *B. g. crassirostris* (11 males, ten females), BGZ = *B. g. zedlitzi* (20 males, three females), BM = *B. mongolicus* (26 males, 16 females), CB = *Callacanthis burtoni* (nine males, eight females), RO = *Rhodospiza obsoleta* (14 males, eight females), RS = *Rhodopechys sanguineus sanguineus* (19 males, eight females), and RSA = *R. s. alienus* (seven males, five females).

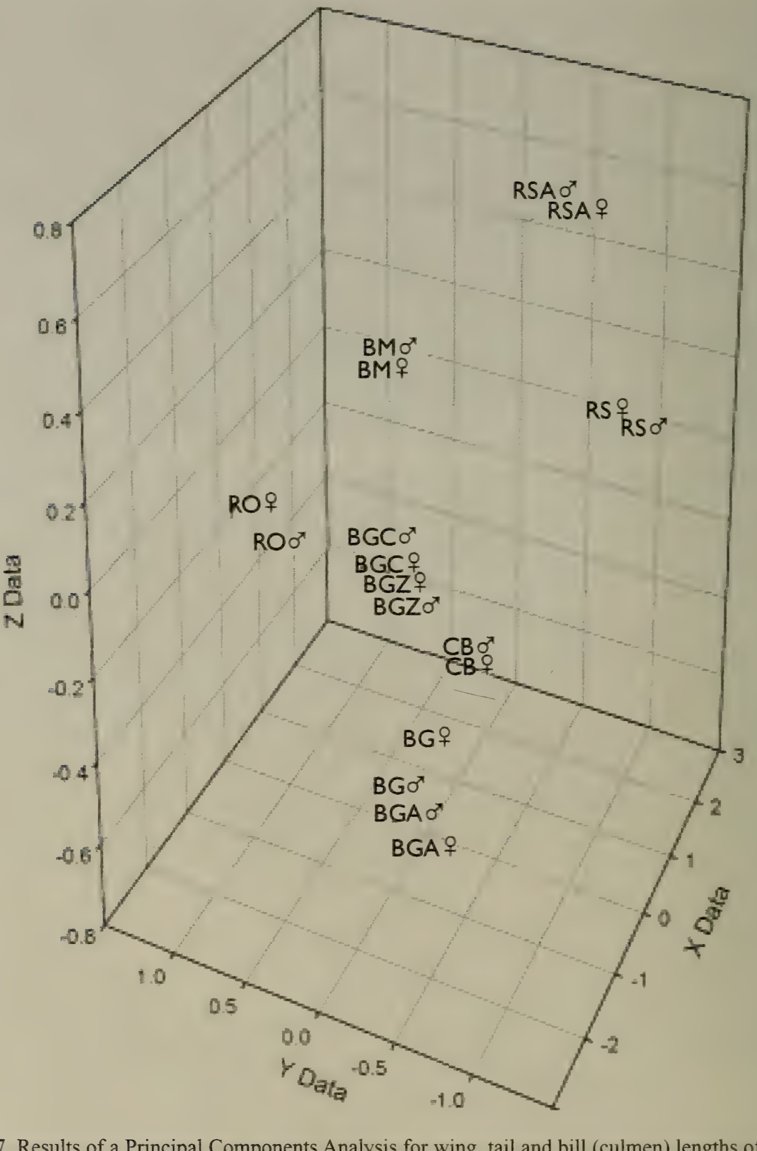

Figure 7. Results of a Principal Components Analysis for wing, tail and bill (culmen) lengths of all taxa of 'desert finches' plotted three dimensionally. BG = *Bucanetes githagineus githagineus* (12 males, three females), BGA = *B. g. amantum* (seven males, seven females), BGC = *B. g. crassirostris* (11 males, ten females), BGZ = *B. g. zedlitzi* (20 males, three females), BM = *B. mongolicus* (26 males, 16 females), CB = *Callacanthis burtoni* (nine males, eight females), RO = *Rhodospiza obsoleta* (14 males, eight females), RS = *Rhodopechys sanguineus sanguineus* (19 males, eight females), and RSA = *R. s. alienus* (seven males, five females).

than from each other, and thus we do not favour the option of subsuming *mongolicus* alone within *Carpodacus* (as proposed by Panov & Bulatova 1972), because of the obvious and highly significant outward (i.e. morphological) differences between them. In some respects, Mongolian Finch shares several morphological characteristics with both Crimson-winged and Desert Finches (see Figs. 2–4). Indeed, Mongolian Finch's unequivocal discovery in the Western Palearctic, in Turkey, was complicated by chronic confusion with both these other species (see Barthel *et al.* 1992, Kirwan & Konrad 1995, Kirwan *et al.* 2000).

Given the findings of Panov & Bulatova (1972), to view the genus *Bucanetes* as monophyletic clearly becomes untenable, but at present few other options for its systematic placement exist. As noted above, both species of *Bucanetes* have been considered within an expanded *Rhodopechys*, along with *R. sanguineus* and *Rhodospiza obsoleta* (see e.g. Vaurie 1949, Cheng Tso-hsin 1987, Sibley & Monroe 1990, Clement *et al.* 1993; equally, some have viewed all four species within *Bucanetes*, although, from a nomenclatural standpoint, this runs *contra* to the principle of priority). Such an arrangement, whilst possessing some obvious advantages and clearly supported by a number of shared morphological, behavioural and other characteristics, also has significant negative results. For *Rhodopechys* cannot really be viewed as a natural or monophyletic grouping either, all four species are significantly different in many respects, and diverge more subtly in others (e.g. their breeding biologies; see Harrison & Castell 2001). Furthermore, Crimson-winged Finch appears to be most closely related to Red-browed (Spectacled) Finch *Callacanthis burtoni*, a monotypic genus found in the Himalayas, which in turn is most closely allied to the rosefinches and the *Acanthis* group (subgenus) of *Carduelis* (C. S. Roselaar in Cramp & Perrins 1994), and these two may prove to be congenerics (as, indeed, they were treated by Ripley 1982). The eggs of *Rhodopechys sanguineus* and *Callacanthis* are remarkably similar, but differ from those of *Bucanetes* and *Rhodospiza*, which three species are generally rather similar (M. P. Walters unpubl. ms.), although their choices of nest location are quite different (Harrison & Castell 2002). Further, Desfayes (1969) demonstrated that *Bucanetes* and *Rhodopechys* are probably not close relatives. Thus, an expanded *Rhodopechys* appears to be a 'catch-all' option for taxa whose relationships are sufficiently enigmatic to defy easy categorisation and are not necessarily congeneric (as was done for many years with a number of African sunbirds; see Irwin 1993, 1999). All of the principal taxa involved, including *Callacanthis burtoni*, are depicted in Figs. 2–5.

Intra-group relationships based on mensural data

GMK, with the assistance of Phil Atkinson, tested the relationships of all taxa within the 'desert finches' grouping based on an analysis of mensural data. These were taken from specimens held at the Natural History Museum, Tring, involving the following samples: *Callacanthis burtoni* (Punjab and north-west India: N=17,

TABLE 1

Means ± SD and sample sizes for wing, tail and bill measurements of the 'desert finches', based on specimens held in the Natural History Museum (Tring). BGG = *Bucanetes githagineus githagineus*, BGA = *B. g. amantum*, BGC = *B. g. crassirostris*, BGZ = *B. g. zedlitzi*, BM = *B. mongolicus*, CB = *Callacanthis burtoni*, RO = *Rhodospiza obsoleta*, RS = *Rhodopechys sanguineus sanguineus*, and RSA = *R. s. alienus*. Any specimen for which one or more dataset could not be measured was excluded from the analysis and table.

	Females				Males			
	Wing (mm)	Tail (mm)	Bill (mm)	*N*	Wing (mm)	Tail (mm)	Bill (mm)	*N*
BGG	79.33 ± 1.15	50.33 ± 0.58	10.23 ± 0.81	3	83.33 ± 2.67	51.58 ± 2.39	10.31 ± 0.43	12
BGA	80.14 ± 2.34	51.14 ± 2.04	10.87 ± 0.31	7	82.43 ± 1.51	53.14 ± 2.27	10.79 ± 0.52	7
BGC	83.6 ± 2.88	54.4 ± 2.63	10.41 ± 0.47	10	87.18 ± 2.32	57.27 ± 4.13	10.80 ± 0.28	11
BGZ	83.67 ± 1.53	54.00 ± 1	10.50 ± 0.46	3	85.75 ± 1.59	54.65 ± 3.23	10.47 ± 0.31	20
BM	86.94 ± 1.69	55.75 ± 3.71	10.17 ± 0.59	16	88.77 ± 1.88	56.65 ± 3.14	10.07 ± 0.52	26
CB	94.44 ± 1.24	64.50 ± 3.89	15.25 ± 0.84	8	98.94 ± 1.84	67.11 ± 3.18	15.38 ± 0.46	9
RO	84.13 ± 1.64	64.25 ± 3.81	11.66 ± 0.46	8	86.36 ± 1.91	64.21 ± 3.62	11.79 ± 0.58	14
RS	99.38 ± 1.85	56.63 ± 2.56	13.64 ± 0.92	8	104.05 ± 2.59	60.26 ± 3.26	13.76 ± 0.65	19
RSA	102 ± 1.87	61.40 ± 1.14	13.60 ± 0.43	5	105.57 ± 2.76	64.00 ± 1.15	13.30 ± 0.4	7

including nine males); *Rhodopechys sanguineus* (Armenia, Syria, Iran, Turkey, Lebanon, Kazakhstan and Samarkand: N=30, including 22 males); *R. s. alienus* (Moroccan Atlas: N=13, including seven males); *Bucanetes mongolicus* (China, Central Asia and Afghanistan: N=44, including 27 males); *B. g. githagineus* (all Egypt: N=15, including 12 males); *B. g. zedlitzi* (Morocco, Algeria and Tunisia: N=24, including 20 males); *B. g. amantum* (Canaries: N=16, including eight males); *B. g. crassirostris* (Punjab and Sind: N=21, including 11 males); and *Rhodospiza obsoleta* (Central Asia: N=22, including 14 males). Specimens were generally sexed according to label data, but these were checked against the literature in the case of suspect identifications. The following data were obtained from each specimen: wing-chord (flattened), tail length and culmen length (to skull), using a standard metal wing-rule with a perpendicular stop at zero (accurate to 0.5 mm), and dial callipers (accurate to 0.1 mm). Specimens for which an incomplete series of mensural data was available were excluded from the statistical analysis.

A Principal Components Analysis (PCA) was performed on the net data, and the results mapped on both two-dimensional (Fig. 6) and three-dimensional plots (Fig. 7). The two-dimensional plot confirmed that (as is well known for these taxa) males are generally larger than females, and further revealed that *Rhodospiza obsoleta*, *Callacanthis burtoni*, *Rhodopechys sanguineus* and *R. s. alienus* are all rather well-differentiated taxa, with the two-dimensional plot also revealing the close relationship that has been suggested between *Callacanthis* and *Rhodopechys*), but the situation surrounding the two *Bucanetes* is rather more complex, although bill morphology and overall size appear to separate the two species. The three-dimensional plot more clearly separates the two *Bucanetes* species, but reveals a close relationship between the different subspecies of *githagineus* (as would be expected).

The PCA results also revealed the marked separation between *Rhodopechys sanguineus sanguineus* and *R. s. alienus*, which will be discussed elsewhere (Kirwan & Atkinson in prep.).

Genus-group nomenclature

Before progressing to any conclusion, we present an updated synonymy of the genus-group names under consideration, including that for Red-browed (Spectacled) Finch, *Callacanthis*.

Callacanthis

Callacanthis Reichenbach, 1850. Avium Systema Naturale, [100 plates of generic details], Section 6, Insessores Enucleatores, pl. lxxviii.

Type by subsequent monotypy, Bonaparte, 1850, Conspectus Generum Avium, **1**, p. 507., *Carduelis burtoni* Gould, 1838.

Section 6 of Reichenbach's generic details has been dated 1 June 1850 by Meyer (1897: vi), with no current evidence to the contrary, whereas livraison 64 of Bonaparte's work bears the printers date of 30 August 1850, and is considered by most commentators to have been issued during December 1850.

Burtonia Bonaparte, 1850. Conspectus Generum Avium, **1**, p. 507.

Type by virtual tautonymy, *Burtonia erythrophrys* (Blyth, 1846) = *Carduelis burtoni* Gould, 1838.

Rhodopechys

Rhodopechys Cabanis, 1851. Mus. Heineanum, **1**, p. 157, fn.

Type by original designation, *Fringilla sanguinea* Gould, 1838 (1837).

Bucanetes

Bucanetes Cabanis, 1851. Mus. Heineanum, **1**, p. 164.

Type by subsequent designation, G. R. Gray, 1855, Cat. Genera Subgenera Birds, p. 81. *Pyrrhula payraudœi* Audouin, 1825 = *Fringilla githaginea* M. H. K. Lichtenstein, 1823.

Cabanis originally included two species, therefore type 'by monotypy' as cited by Howell *et al.* (1968: 263) is incorrect.

Rhodospiza

Rhodospiza Sharpe, 1888. Cat. Birds Brit. Mus., **12**, p. 282.

Type by monotypy, *Fringilla obsoleta* M. H. K. Lichtenstein, 1823.

From the above, it is self-evident that *Rhodopechys* Cabanis, 1851, has page priority over *Bucanetes* Cabanis, 1851, as the senior name for the 'desert finches' if all four species are considered congeneric, and this, indeed, has long been accepted as the case. Should, however, *Callacanthis burtoni* (Gould, 1838) also be included then *Callacanthis* Reichenbach, 1850, would have seniority.

A new genus for *mongolicus*?

It seems entirely plausible to us that each of the four species included within *Rhodopechys* by, e.g., Sibley & Monroe (1990) warrants separate generic allocation, and it is surely significant to note that no less a commentator than Voous (1977) struggled with the systematic position of many of the carduelines, he being forced to acknowledge the striking distinctiveness and the lack of obvious relationships of a number of taxa. We recommend that all four of these 'desert' finches and *Callacanthis* be subject to DNA analysis in order to more clearly define their relationships. As can be seen from the synonymy, no generic name currently exists to serve for a monotypic *mongolicus*. Sharpe (1888: 284) included both 'trumpeter' finches within *Erythrospiza* (Bonaparte; *Bp. Faun. Ital.*, Ucc. Pl. 35 fig. 3 [1832–41]), but as was shown by W. L. Sclater (1926: 130) Bonaparte introduced this name earlier, in 1831, with G. R. Gray's (1840: 48) designation of *Loxia erythrina* Pallas, 1770, as the type, precluding *Erythrospiza* from being the generic name for any of the 'desert finches' (Howell *et al.* 1968: 267).

In our opinion, until such time as it becomes possible to conduct a detailed and robust molecular analysis of these and other outlying taxa, it seems logical either to treat all of the four species of 'desert finches' within their own monotypic genera or to include all within *Rhodopechys*, almost certainly expanded to incorporate *Callacanthis*. If the former, then the relationship of *mongolicus* to those species traditionally included within *Carpodacus* requires further evaluation. P. C. Rasmussen (*in litt.* 2003) notes that *Carpodacus*, as currently understood, also appears to represent a non-monophyletic assemblage, and therefore demands revision. We therefore anticipate the need for an exclusive generic name for the Mongolian Finch, and propose here:

Eremopsaltria, gen. nov.

Type Species: *Carpodacus mongolicus* Swinhoe, 1870. Proc. Zool. Soc., London, p. 447.
Etymology: Greek ῴϱημία *eremia*, desert, and ψάλτϱια *psaltria*, female lyre-player, singer.
Gender: feminine.
Monotypic.
New Combination:

Eremopsaltria mongolica (Swinhoe, 1870).

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Authors are invited to submit papers on topics relating to the broad themes of taxonomy and distribution of birds. Descriptions of new species of birds are especially welcome and will be given priority to ensure rapid publication, and may be accompanied by colour photographs or paintings.

Submission may be made electronically to the Editor (GMKirwan@aol.com): if large (>1mb) files are involved, e.g. to include illustrations, please contact editor first. Submission may also be made by post (to Guy Kirwan, 74 Waddington Street, Norwich NR2 4JS, UK); in this case send two hard copies and also a copy on a 3.5" disk, as **Word or WordPerfect** files for PC. Where possible, reviews, and returns of papers and reviewers' comments to authors, will be undertaken electronically.

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Primary headings—lower case, centred, bold

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English names of animals should begin with capitals; give English name at first mention of every species.

Numerals—thousands separated by commas, e.g. 1,000, 12,000

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Statistical tests in the form: ($r_{28} = 3.12$, $P < 0.01$). ($X^2_3 = 7.31$, n.s.)

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MEMBERSHIP

See also website: **http://www.boc-online.org**

All correspondence on membership, and changes of address should be addressed to: **The Membership Secretary**, Cdr. M.B. Casement, OBE, RN, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA, UK (or **e-mail: mbcasement@aol.com**). For details of Club Meetings see inside front cover. For membership and subscription information, purchase of back numbers and other BOC publications, see the inside rear cover of Vol. 124(4) or the BOC website.

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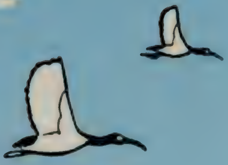

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MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. (Limited car parking facilities can be reserved [at a special reduced charge of **£5.00**], on prior application to the Hon. Secretary.)

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm.** (A vegetarian menu can be arranged if ordered at the time of booking.) Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges are **£20.00** as from **1 January 2005.**

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

7 June 2005—Dr Joanne Cooper—*A Tomb Wader exposed: x-raying the birds of the gods*
From a background in geography and geology (but with a long-term interest in birds), Jo studied the Late Pleistocene avifaunas of Gibraltar for her PhD in the Bird Group of The Natural History Museum. During this time she also began working with the Museum's collection of ancient Egyptian bird mummies, using her experience of avian osteology to identify and analyse the specimens. Her work at the Bird Group was then interrupted by spending a year in New Zealand pursuing her interests in the fossil birds of the Chatham Islands. Returning to the UK in 2001, she went back to the NHM, where she now works as one of the Bird Group's curators. Following a surge of interest in the NHM's animal mummies, she has recently re-opened her files on the mummies and is actively researching them once again.

*Applications to Hon. Secretary (address below) by **24 May** please.*

27 September 2005—Dr Colin Ryall—*An assessment of the worldwide spread of the House Crow: present and future*
After completing a research fellowship in microbial ecology at the Institute of Dermatology, Colin took up a series of posts in Africa. In 1984, whilst working in Mombasa and carrying out bird research in his spare time, he first encountered the House Crow *Corvus splendens* and has been hooked ever since. Colin is currently a Senior Lecturer in Environmental Management at Kingston University and has published *c.*50 papers, 13 of them on *C. splendens*. Over the past century or so, *C. splendens*, a native of the Indian region, has spread to all continents except Antarctica, frequently with adverse consequences. This talk will review this invasion and the species' present status, and discuss future potential impacts.

*Applications to Hon. Secretary (address below) by **13 September** please*

Future meetings in 2005—dates for further meetings in 2005 have been set for the following Tuesdays: 1 November and 6 December. **Speakers to be announced.**

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2005, giving as much advance notice as possible—please contact: Tony Statham, Ashlyns Lodge, Chesham Road, Berkhamsted, Herts. HP4 2ST, UK (or e-mail: SAHS@tinyonline.co.uk).

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Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 125 No. 2 Published 13 June 2005

CLUB ANNOUNCEMENTS

E. D. H. Johnson. It is with great regret that we report that 'Johnnie' died on 24 February 2005, at his home in Jersey, aged 85. A member of the Club since 1970, he was bird recorder for Jersey 1949–74, and was well known to many as a bird photographer and sound recorder. He was a contributor to numerous journals (including *Bull. Brit. Orn. Cl.*) and TV films. His special interests included trans-Saharan migration, and with his late wife, Gwen (who died in 1994), he led many expeditions to south-east Morocco, the Algerian Sahara, Ethiopia, South Africa and the Indian subcontinent.

Changes to the Committee. Following the AGM (26 April) the composition is now as shown on the inside rear cover.

Membership Secretary. Michael Casement has now assumed the chairmanship but will continue as *Hon. Membership Secretary* until handing over these responsibilities to Steve Dudley, BOU Administrator, at a date to be announced.

Subscription underpayments. Rates were increased as of 1 January 2005 to £17.50 for BOU members, £24 for non-BOU members and £32 for libraries and institutions, but a significant number have failed to increase their Bankers Standing Order (BSO) arrangements and are thus underpaid for 2005. Individuals have been notified but early action by those who have not yet remedied the underpayment **(£5.50** for members of the BOU) would be greatly appreciated—to Michael Casement, please.

Subscription rates for 2006 **will be unchanged.**

The 926th meeting of the Club was held on Tuesday 2 November 2004, in the Sherfield Building Annexe, Imperial College, London. 26 members and 9 guests were present.

Members attending were: Dr C. F. MANN (*Chairman*), D. N. S. ALLEN, Miss H. BAKER, I. R. BISHOP, D.R. CALDER, Cdr. M.B. CASEMENT, RN, Professor R.A. CHEKE, E. C. DICKINSON, Dr C. T. FISHER, D. FISHER, F. M. GAUNTLETT, Revd T. W. GLADWIN, D. GRIFFIN, K. HERON, R. P. HOWARD, R. H. KETTLE, R. R. LANGLEY, D. J. MONTIER, A. J. PITTMAN, Dr R. P. PRŶS-JONES, Dr P. G. W. SALAMAN, P. SELLAR, S. A. H. STATHAM, C. W. R. STOREY, G. THOMAS and Dr C. G. VIOLANI

Guests attending were: R. C. FLEISCHER (*Speaker*), Miss G. BONHAM, Mrs J. CALDER, Mrs M. H. GAUNTLETT, Mrs J. M. GLADWIN, R. HEATON, Mrs J. A. JONES, Mrs M. MONTIER and B. WARREN.

After dinner, Robert C. Fleischer gave a talk on aspects of *Hawaiian bird evolution and conservation*, which he summarised as follows.

The Hawaiian archipelago is an amazing laboratory for studying evolution, extinction and the conservation biology of birds, and examples of this were provided from my and my collaborators' long-term research programme. An overview of the conveyor belt formation of the islands and how this has impacted the habitats of the archipelago, the evolution of Hawaiian organisms via the processes of adaptive radiation, and our ability to reconstruct a timeframe for Hawaiian bird evolution were all discussed. Examples of the diversity of Hawaiian birds, past and present (including fossil bird reconstructions by Julian Hume based on the work of Storrs Olson and Helen James) were presented, and Dr Fleischer discussed those factors that led to the extinction of over half of Hawaii's bird species by *c.*500 years ago

Ancient DNA methods are now able to recover many aspects of the history of these birds that would be unknowable without such technology. In particular, examples from my collaborative research on (1) the phylogeny of extinct, giant flightless waterfowl, and (2) how genetic variation was apparently lost more than 500 years ago in the globally threatened Hawaiian Goose or Nene *Branta sandvicensis*. Finally, the speaker discussed some of the current threats to Hawaiian birds, especially detailing the risks from introduced diseases (avian malaria and poxvirus) spread by invasive mosquitoes and abetted by introduced European pigs, and what man is doing to understand this complex biological system using genetic and other methods.

ANNUAL GENERAL MEETING 2005

1. The Annual General Meeting of the British Ornithologists' Club was held in the Sherfield Building Annexe, Imperial College, London SW7, on Tuesday 26 April 2005 at 6 pm with Dr C. F. Mann in the Chair. Seventeen members were present (including eight from the committee) and apologies were received from: Dr P. G. W. Salaman, C. W. S. Storey, Revd. T. W. Gladwin, P. J. Wilkinson, S. W. Lowe, D. J. Fisher and Dr W. R. P. Bourne. The Minutes of the 2004 AGM, held on 27 April 2004, which had been published *(Bull. Brit. Orn. Cl.* 124: 74–76), were approved and signed by the Chairman.

2. Chairman's report. At each AGM I tell you I think we have had a very successful year, and you may well be bored with hearing it, but once again I believe it is true for last year.

We held seven dinner meetings during the year, six with full talks on diverse topics by experts in their various fields. All were delivered with considerable erudition and stimulated lively discussions indicating much interest from the audience. The AGM was followed as usual by mini-talks, in this case six, on a variety of topics. The mean attendance at 33.1 per meeting was slightly down on the previous year.

Membership of the Club again fell slightly, down now to 539. However, fluctuations are the norm, and other societies, such as BOU and Linnean Society, seem to have similar problems over retention and recruitment of members. I am only too aware of the enormous effort that the Hon. Membership Secretary puts into the chasing of recalcitrant members for their subscriptions. One positive sign is that three of our student members, who enjoyed free membership for a year, have now joined as full members, and others have indicated that they may follow suit in future when their financial situations permit.

Our website continues to be expertly managed by Paul Salaman and attracts many hits. Progress continues to be made on the scanning of the Bulletin, although it may be some time before all issues are available on CD.

You will be hearing in more detail from our Hon. Treasurer that our financial situation is again very sound, with an increase of income over expenditure of just over £10,000. A new asset of the Club is an electronic projector. More speakers are now using PowerPoint presentations, and the hiring of such equipment is prohibitively expensive.

The BOU–BOC Joint Publications Committee has continued in worthy fashion, thanks to the Chairman Tom Gladwin and its members. Two regional checklists, Morocco and Hispaniola, have appeared and been well received. Two further regional checklists have been delayed due to illness, but they, and the *Bird Atlas of Uganda*, will hopefully appear this year. Other checklists are in the pipeline, as are the proceedings of the conference on Recent Avian Extinctions, which will appear in the Bulletin.

Vol. 124 of the Bulletin was produced to an excellent standard. Thanks and congratulations are due to the Hon. Editor, Guy Kirwan, for this achievement. As you will hear later, papers on the Neotropics feature prominently. The increasing interest in this part of the world by British and other European ornithologists may have some part to play, but I like to think that the enhanced reputation of the Bulletin is also part responsible for more authors choosing the Bulletin over North American publications.

The plans to develop a joint administration with the BOU have come to fruition, and should be fully implemented soon. Regrettably we had to increase the Club's subscription with effect from January this year to £17.50 for BOU members, £24 for non-BOU members and £32 for institutions.

As this is the last time I shall be speaking to you in this capacity, I must thank all committee members for their hard work and support during my four years as Chairman. In particular I must single out our Hon. Treasurer, David Montier, for all his efforts and diligence with the Club's finances. Tony Statham took over as Hon. Secretary one year ago and has proved himself a worthy successor to Michael Casement. Above all, my very sincere thanks go to Michael. He served as Hon. Secretary during the first three years of my tenure, and then as Hon. Membership Secretary seeing through the difficult period of subscription change. The latter post he then combined with that of Vice-Chairman when Mary Muller had to step down. His devotion to the Club knows no bounds and he is willing to involve himself in every problem that presents itself. If a few days pass without an e-mail from Michael I start to worry. Thanks also go to the trustees of the Herbert Stevens Trust Fund, to Pat Sellar and Ron Kettle for their assistance and expertise with audio-visual equipment, and finally to Imperial College for providing a venue and meals for our meetings.

3. Trustees Annual Report. The Chairman advised the meeting that the Trustees Annual Report and Annual Accounts were again combined in the handout available to those attending the meeting, and confirmed that these would also be published in the June issue of the Bulletin. The Hon. Treasurer drew attention to a few facts in the report and accounts, highlighting the increase in the value of the Club's investments (+9.5%), which was slightly ahead of the performance of the FTSE All-Share index during the same period (+9.21%). The Hon. Treasurer also explained details of the Restricted Funds and advised that copies of the accounts for the Herbert Stevens Trust Fund were available to those wanting a copy.

4. The Bulletin. 2004 was a successful year for the Bulletin. Some 32 papers were published, including the type descriptions of three taxa. Mean waiting times for publication remain at 13–14 months, and one of the key aims for 2005 and beyond is to reduce the gap between submission and publication. Other future plans include publication of the Recent Avian Extinction conference proceedings as part of the Bulletin. The Hon. Editor thanked Eng-Li Green, Mike Dawson and Crowes, Mary Muller, Michael Casement, Tony Statham, and staff of the Natural History Museum (Tring) for their diverse assistance during the year.

5. Publications report. Revd. Tom Gladwin had sent apologies for his absence and the Chairman asked Tony Statham to provide an update on the activities of the Joint Publications Committee (JPC). Tony Statham drew attention to the relevant section in the Trustees Annual Report and confirmed the Chairman's comment that the *Bird Atlas of Uganda* was expected this year, probably in June/July. Other publications for 2005 should include *The Birds of São Tome and Príncipe with Annobón* and *The Birds of Borneo*, both of which had been delayed by illness. Future publications planned for 2006 include *The Birds of Singapore* whilst work will commence on a new *Status of Birds in Britain and Ireland.* The Chairman and the Hon. Treasurer had highlighted the successful sales of *The Birds of Morocco*, which has been nominated as '=4th Best Bird Book of the Year' by *British Birds.* The Hon. Secretary concluded with a reminder that the JPC was grateful to the late Janet Kear, who had made a very significant contribution as Commissioning Editor of the Checklist Series, and to Steve Dudley for progressing and managing the titles in its charge.

6. Election of Officers and Committee. The Chairman said that the proposed changes to the Committee were as published in *Bull. Brit. Orn. Cl.* 125 (1): 1.

- Cdr. M. B. Casement, OBE, RN, be elected Chairman (*vice* Dr C. F. Mann) and to continue (*ex-officio* until further notice) as *Hon. Membership Secretary.*
- Miss H. Baker be appointed to the Committee (*vice* Mrs Mary Muller) and be appointed *Vice-Chairman.*
- Mr D. J. Montier be re-elected as *Hon. Treasurer.*
- Mr S. A. H. Statham be re-elected as *Hon. Secretary.*
- Dr J. H. Cooper be appointed to the Committee (*vice* Prof. R. A. Cheke)
- Mr P. J. Wilkinson be appointed to the Committee (*vice* Dr P. G. W. Salaman)

The following *ex-officio* members were confirmed in continuation.

- Revd. T. W. Gladwin (*Chairman Joint Publications Committee*)
- Prof. R. A. Cheke (*Hon. Publications Officer*)
- Dr P. G. W. Salaman (*Hon. Website Manager*)
- Mr G. M. Kirwan (*Hon. Editor*)

7. Any Other Business. The Chairman asked the Hon. Secretary (Tony Statham) to read a letter sent by member Dr W. R. P. Bourne. After the initial paragraph submitting apologies for his absence at the AGM, Dr Bourne stated "It seems a pity that the Club's excellent supplement to Bulletin Vol. 123 (Why Museums Matter) should be spoilt by the inclusion on pp.226–233 of an account of the collection of no less than 665 Great Grey Shrikes in a limited area for no clear purpose when a tenth of that number should have been sufficient for all the investigations described there. This is exactly the sort of behaviour that brings both museums and ornithology into disrepute, and I thought it was now generally agreed that accounts of such activities should no longer be included in respectable publications. It seems possible that this example (which I shall be commenting on in an otherwise favourable review in *British Birds*) might become a classical example of museum misbehaviour. I suggest that the Club should pass a motion that it should be more careful what it publishes in future?"

The Committee had considered Dr Bourne's letter briefly before the AGM and subsequently the Hon. Editor concluded on consulting the paper in question that the sample was not excessive given the timescale over which it was taken and the overall large area in which it was made. The Committee in general thought that no blame was attributable to the Club; the publication reported the proceedings of an international conference and the paper in question had been quoted verbatim.

The meeting closed at 6.32 pm.

BRITISH ORNITHOLOGISTS' CLUB

Founded 5 October 1892
Registered Charity No. 279583

TRUSTEES ANNUAL REPORT FOR 2004

List of Trustees—Committee

Dr C. F. MANN *Chairman* (2001)
Cdr. M. B. CASEMENT, OBE, RN, *Vice-Chairman and Membership Secretary* (2004)
S. A. H. STATHAM *Hon. Secretary* (2004)
D. J. MONTIER *Hon. Treasurer* (1997)
I. R. BISHOP, OBE (2003)
Prof. R. A. CHEKE (2001)
J. P. HUME (2004)
Dr P. G. W. SALAMAN (2001)
C. W. R. STOREY (2003)
Ex-officio Revd. T. W. GLADWIN *Chairman* JPC (2002)

Correspondence and enquiries to the Hon. Secretary, Ashlyns Lodge, Chesham Road, Berkhamsted, Herts. HP4 2ST

Auditors and Independent Examiners Porritt Rainey & Co, 9 Pembroke Road, Sevenoaks, Kent TN13 1XR

Bankers Barclays Bank plc, Dale House, Wavertree Boulevard, Liverpool L7 9PQ

Constitution

The British Ornithologists' Club was founded in October 1892. It currently operates under Rules revised in 2000 and approved at a Special General Meeting on 31 October of that year. Members of the Committee, who are also the Trustees of the Club, are listed above with the dates of their appointment. Committee members are elected for a term of four years, with the exception of the Hon. Secretary and Hon. Treasurer, who are both subject to re-election at each AGM.

Objects of the Charity

The promotion of scientific discussion between Members of the British Ornithologists' Union and others interested in ornithology, and to facilitate the dissemination of scientific information concerned with ornithology, with a particular emphasis on avian systematics, taxonomy and distribution.

The Committee

The Committee met seven times during the year. Mrs M. N. Muller, Vice-Chairman, tendered her resignation in September and it was agreed that Cdr. M. B. Casement would act as Vice-Chairman until the AGM in April 2005 as well as continuing his *ex-officio* role as Membership Secretary. The appointments of S. A. H. Statham as Hon. Secretary in succession to Cdr. M. B. Casement, Prof. R. A. Cheke as Honorary Publications Officer *vice* J. A. Jobling and J. P. Hume as a member of the committee in succession to S. A. H. Statham were approved at the AGM on 27 April 2004.

Dr P. G. W. Salaman (Hon. Website Manager) continued to maintain the BOC website and Messrs. S. M. S. Gregory and M. A. Carr made further progress on the project for the electronic archiving and marketing of the complete set of the Bulletin. Discussions continued with the BOU towards sharing administration costs for both societies; in line with this proposal, the BOU took over the subscription management of BOC Institutional Subscribers and sales of BOC publications as from 1 June 2004.

The Committee continues to be most grateful to the Trustees of the Herbert Stevens Trust Fund (Mr Nigel Crocker, Mr Peter Oliver and Mr Richard Price) for their time and expertise advising on the performance of the Fund.

Meetings

The number of evening meetings held at Imperial College, London, was maintained at seven in 2004. A total of 219 (162 members and 57 guests) attended these meetings, which represented an average attendance of 31.3. The programme of speakers again covered a wide variety of ornithological subjects both in the UK and overseas, including Red Kites, the extinct Labrador Duck and eggshell maculation in the Great Tit. As in previous years, the 27 April meeting following the AGM took the form of a social evening, during which informal short talks and brief discussions were contributed by six participants on a range of subjects from individual species to digiscoping and postage stamps of birds. Summaries of all these are to be found in the Club Announcements section of the *Bulletin*. Regrettably, Imperial College increased their catering and venue charges for 2004 requiring an increase in the cost of Club dinners to £19 per head.

The Bulletin

Vol. 124 contained 292 pages and the 32 papers covered a broad geographical spread although, as has become usual in recent years, there was a strong accent on new distributional data from the Neotropics. Nonetheless, other traditional Bulletin topics of taxonomy and nomenclature were also well represented, with descriptions of three new taxa, all from Asia, appearing during the year. These were: new owl species in Sri Lanka and Indonesia, and a new subspecies of monal pheasant from the Indian subcontinent. Following the recent pattern, all of the new taxa were well illustrated in colour, and the Bulletin continues to act as an important forum for publication of new forms, especially given the Bulletin's priority for such papers.

For papers published in 2004, the interval between receipt and publication was 3–29 months, averaging 13–14 months, which is the norm in recent years. It is hoped to reduce 'waiting time' to 10–12 months. The Bulletin retains its popularity, with a total of 58 new manuscripts being received during 2004. Of these, 14 were rejected and three withdrawn by their authors following review, whilst of the remainder five are still being refereed.

Grateful thanks are due, as always, to referees who have given freely of their time and expertise, as well as to Eng-Li Green, of Alcedo Publishing, and Mike Dawson and team, of Crowes (our printers), for their support and efficiency. Mary Muller cheerfully produced the index, Tony Statham and Michael Casement prepared the cover information and Club Announcements, and staff at the Natural History Museum, Tring, also provided much-appreciated support to the Hon. Editor.

Bulletin Sales

Subscriptions from Institutional Subscribers during 2004 totalled 105 (down from 113 in 2003), with 24 in the UK and 81 overseas (25 different countries). Of the latter 36 were from the USA, 27 from Europe, five from Australia and four each from Canada, Asia and Africa.

Report of the Joint Publications Committee

The BOC–BOU Joint Publications Committee (JPC), formed in May 2002 under the continuing chairmanship of Revd. T. W. Gladwin, comprised: S. P. Dudley (Publications Manager), the late Prof. J. Kear (Checklist Editor), Prof. R. A. Cheke (Commissioning Editor), D. J. Montier, N. J. Redman and S. A. H. Statham. The joint committee (JPC) met once in 2004. Several titles progressed towards publication and two new proposals were considered. Four proposed titles have been cancelled and no progress has been reported on five others. The Chairman is alternately appointed by the BOC and BOU. Tom Gladwin has accepted the BOC's invitation to continue for a further two years from April 2005. Bob Cheke succeeded James Jobling as Commissioning Editor for the BOC and Tony Statham has been appointed the BOC's other representative. As a result of Janet Kear's death there were two vacancies to be appointed by the BOU. (Since this report was written, the BOU has appointed Dr Chris Perrins to the JPC).

Forthcoming Publications. The checklists *The Birds of São Tome and Príncipe with Annobón* and *The Birds of Borneo* have been delayed by illnesses. These and the *Bird Atlas of Uganda* are now expected to be published in 2005. The proceedings of the conference on Recent Avian Extinctions are to be published in the Bulletin of the British Ornithologists' Club.

Future Publications. The checklist *The Birds of Singapore* is progressing, with publication anticipated in 2006. Work will commence on a new *Status of Birds in Britain and Ireland*, which the JPC has proposed should properly be published as part of the Checklist series.

Acknowledgements. The Committee is grateful to Dilys Breese and James Jobling who retired in April, to the late Janet Kear who made a very significant contribution as Commissioning Editor of the Checklist series, and to Steve Dudley for progressing and managing the titles in its charge.

Membership

As at 31 December 2004, there were 539 paid-up Members: 291 with addresses in the UK and 248 overseas in 43 countries. Overseas figures included USA (48), Germany (27), The Netherlands (14) and France (13); 16 Members have addresses in South American countries (Brazil, Colombia, Ecuador, French Guiana and Peru). The Club welcomed 11 new Members, including three previous Members reinstated; additionally, nine new Members joined as of 1 January 2005, including three former student free members for 2004. But the Club mourned the death of one Member: Dr R. S. Marrus (1994–2001), whose death in 2001 was reported in January 2004. There were seven resignations; also seven who gave advance notice they would not renew for 2005, and 12 were removed under Rule 24, resulting in a net decrease in membership of nine during the year.

Finance

Total assets of the Club at 31 December 2004 totalled £387,437, compared with £357,360 at the end of 2003, an increase of £30,077. Of this improvement, £20,067 is the result of a further increase in the value of the Club's investments and the balance of £10,010 represents the excess of income over expenditure for the year.

Total income in 2004 at £36,612 was slightly lower than in 2003. Subscriptions dropped to just below £10,000, which included a contribution of £590 in tax repayments on Gift Aid and Deeds of Covenant. Investment income of £16,770 showed a slight increase, mainly because of a gradual rise in interest rates offsetting marginally lower income from the unit trust holdings as the tax credits on distributions were phased out. Income from sales of publications, of £5,466, benefited from sales of *The Birds of Morocco* and *The Birds of Hispaniola* published with the BOU as our first two joint publications. It is very encouraging to see that *British Birds* has just nominated *The Birds of Morocco* as '=4th Best Bird Book of the Year'. After the initial burst of sales at the end of 2003 and in 2004, income from these titles will inevitably slow.

Expenditure totalled £26,602, well down on the previous year because no new publications appeared, though work is progressing on a number of new titles. Bulletin costs increased to £13,821 and continued to outstrip subscription income. Administration expenses were £3,807 for the year, including, for the first time, a management fee paid to the BOU for taking responsibility part way through the year for handling institutional subscriptions and sales of publications, including back numbers of the Bulletin.

In 2005, there is expected to be increased expenditure on new publications, particularly the *Bird Atlas of Uganda*, which after a long preparation period should appear in print during the year, and a further rise in administration costs as the BOU takes over collection of subscriptions previously handled voluntarily by our extremely hard-working Membership Secretary.

Investments

As stock markets maintained their recovery in 2004, the value of the Club's investments in charity unit trusts held in the Herbert Stevens and Barrington Trust Funds increased to £229,384 by 31 December, an increase of 9.5% over the year, though after allowing for inflation they are still well below the exceptional highs of earlier years in real terms. Total investments in the Balance Sheet are stated at £278,384, the additional £49,000 being the capital from the Clancey bequest currently deposited in a fixed-rate Building Society account.

Reserves

Of the Club's total resources, £20,000 is held in a Designated Unrestricted Fund towards the cost of future publications and £56,872 in Restricted Funds as backing for new developments for the Bulletin or additions to the Club's Occasional Publications series. The investments that form a large part of the Unrestricted Funds are the result of past legacies and provide a regular source of income towards the Club's administrative expenses, whilst additional liquid funds are available to finance future planned publications. This can involve substantial expenditure against a rather slow payback, as expected with specialist publications that are highly valued, but fall within an inevitably limited market.

Risks

The Committee has reviewed the major risks to which the Club is exposed, particularly with regard to safeguarding the Club's investments held in diversified portfolios within separately managed charity unit trusts, providing an acceptable balance between security and risk, and also managing the Club's cash resources and publications within a controlled timetable. A joint committee with the BOU considers proposals and forwards recommendations for further publications, bearing in mind the level of resources available.

Trustees' Responsibilities

Under the Charities Act 1993, the Trustees are required to prepare a statement of accounts for each financial year which gives a true and fair view of the state of affairs of the charity at the end of the financial year, and of the incoming resources and application of resources in the year. In preparing the statement the trustees are required to.

- Select suitable accounting policies and then apply them consistently;
- Make judgements and estimates that are reasonable and prudent;
- State whether applicable accounting standards and statements of recommended practice have been followed, subject to any material departure disclosed and explained in the statement of accounts;
- Prepare the financial accounts on the going concern basis unless it is inappropriate to presume that the charity will continue its operations.

The Trustees are responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the charity, and to enable them to ensure that any statement of accounts prepared by them complies with the regulations under section 41 (1) of the Charities Act 1993. They are also responsible for safeguarding the assets of the trust and hence for taking reasonable steps for the prevention and detection of fraud and any other irregularities.

Approved and signed on behalf of the Trustees

C. F. Mann
Chairman

Date: 26 April 2005

BRITISH ORNITHOLOGISTS' CLUB

BALANCE SHEET—31 December 2004

		2004		*2003*	
	Notes	£	£	*£*	*£*
FIXED ASSETS					
Projection Equipment	2		486		-
INVESTMENTS					
At Market Value	3		278,384		*258,317*
CURRENT ASSETS					
Stock of Publications		100		*100*	
Cash at Bank and in hand		4,404		*3,143*	
Cash on Deposit		109,828		*101,368*	
Prepayments		363		*338*	
Other Debtors		1,692		*880*	
		114,873		*98,244*	
CURRENT LIABILITIES					
Subscriptions in advance		(4,142)		*(3,589)*	
Creditors falling due within one year		(3,678)		*(3,197)*	
			108,567		*99,043*
TOTAL ASSETS			387,437		*357,360*
FUNDS					
Unrestricted					
Designated	4		20,000		*15,000*
Other	5		310,565		*287,773*
			330,565		*302,773*
Restricted	6		56,872		*54,587*
			387,437		*357,360*

Approved and Signed on behalf of the Trustees

C. F. Mann
Chairman

Date: 29 April 2003

STATEMENT OF FINANCIAL ACTIVITIES—31 December 2004

	2004			*2003*
	Unrestricted	Restricted	Total	*Total*
	£	£	£	*£*
INCOMING RESOURCES				
SUBSCRIPTIONS				
Members	6,970	-	6,970	*7,067*
Institutional subscribers	2,300	-	2,300	*2,768*
Income Tax recoverable under Gift Aid & Deeds of Covenant	590	-	590	*541*
	9,860	-	9,860	*10,376*

DONATIONS		**38**	-	**38**	*135*
INVESTMENT INCOME					
Herbert Stevens Trust Fund		**10,215**	-	**10,215**	*10,383*
Barrington Trust Fund		**36**	-	**36**	*36*
Interest received		**4,234**	**2,285**	**6,519**	*5,744*
		14,485	**2,285**	**16,770**	*16,163*
SALES OF PUBLICATIONS					
Bulletin		**160**	-	**160**	*1,533*
Other BOC publications		**831**	-	**831**	*1,501*
Joint BOU/BOC Checklists		**4,475**	-	**4,475**	*5,554*
		5,466	-	**5,466**	*8,588*
MEETINGS		**4,127**	-	**4,127**	*4,227*
OTHER INCOME		**351**	-	**351**	*82*
TOTAL INCOME		**34,327**	**2,285**	**36,612**	*39,571*
RESOURCES EXPENDED					
CHARITABLE EXPENDITURE					
MEETINGS					
Room and equipment hire, speakers' expenses, etc.		**1,468**	-	**1,468**	*1,495*
Restaurant		**4,119**	-	**4,119**	*4,376*
CONFERENCE SPONSORSHIP		**500**	-	**500**	-
BOC BULLETIN					
Production, printing and distribution		**13,821**	-	**13,821**	*11,245*
Computer software		-	-	-	*1,099*
Costs related to special sales offer of back numbers		**2,058**	-	**2,058**	-
ADMINISTRATION	7	**3,807**	-	**3,807**	*4,880*
OTHER EXPENDITURE		**180**	-	**180**	-
TOTAL EXPENDITURE		**26,602**	-	**26,602**	*47,395*
EXCESS OF INCOME OVER EXPENDITURE		**7,725**	**2,285**	**10,010**	*(7,824)*
Increase in value of investments		**20,067**	-	**20,067**	*21,297*
		27,792	**2,285**	**30,077**	*13,473*
TOTAL FUNDS brought forward at 1 January 2004		**302,773**	**54,587**	**357,360**	*343,887*
TOTAL FUNDS at 31 December 2004		**330,565**	**56,872**	**387,437**	*357,360*

NOTES TO THE ACCOUNTS—31 December 2004

1. ACCOUNTING POLICIES

a) Basis of Accounts. The Financial Statements are prepared under the historical cost convention as modified by the inclusion of investments in the Herbert Stevens and Barrington Trust Funds at market values. They are also prepared in accordance with the Financial Reporting Standard for Smaller Entities (effective June 2002) and follow the recommendations in Accounting and Reporting by Charities: Statement of Recommended Practic issued in October 2000.

b) Investments and Cash Deposits. The Herbert Stevens and Barrington Trust Funds are invested in quoted charity unit trusts and included as investments in the Balance Sheet at year-end market values. Income from these funds and from cash deposits shown in the Balance Sheet under Current Assets is included in Incoming Resources in the Statement of Financial Activities on a receipts basis. The Clancey Bequest is held in a fixed-term, Building Society deposit account which forms part of the total of investments in the Balance Sheet. Interest on this deposit account is brought into the Statement of Financial Activities on an accruals basis.

c) Subscriptions. Subscriptions for the current year and any arrears are included in Incoming Resources in the Statement of Financial Activities. Subscriptions received in advance are carried forward in the Balance Sheet as Current Liabilities.

d) Expenditure is accounted for on an accruals basis.

e) Depreciation. Depreciation of fixed assets is calculated to write off their value over their expected useful lives at an annual rate of 25% on cost.

f) Publications. The cost of publications is written off in the Statement of Financial Activities as incurred except for a nominal stock value of £100 carried in the Balance Sheet.

3. FIXED ASSETS

Projection Equipment	**2004**
	£
Additions	648
Depreciation for the year	162
Net Book Value at 31 December 2004	**486**

3. INVESTMENTS—at market value

	2004	*2003*
	£	£
UNRESTRICTED FUNDS		
Herbert Stevens Trust Fund	**228,381**	*208,377*
Barrington Trust Fund	**1,003**	*940*
RESTRICTED FUNDS		
Clancey Bequest	**49,000**	*49,000*
	278,384	*258,317*

All investments are held in the UK.

4. UNRESTRICTED DESIGNATED FUND

for future publications	**2004**
	£
Balance at 1 January 2004	15,000
Designated during the year	5,000
Balance at 31 December 2004	**20,000**

5. OTHER UNRESTRICTED FUNDS

	General Fund	Herbert Stevens Trust Fund	Barrington Trust Fund	TOTAL
	£	£	£	£
Balances at 1 January 2004	78,456	208,377	940	287,773
Increase in value of investments during year	–	20,004	63	20,067
Excess of income over expenditure	7,725			7,725
Transfer to Unrestricted Designated Fund	(5,000)	–	–	(5,000)
Balances at 31 December 2004	**81,181**	**228,381**	**1,003**	**310,565**

6. RESTRICTED FUNDS

	Clancey Bequest	Publications Fund	Bird Atlas of Uganda Fund	TOTAL
	£	£	£	£
Balances at 1 January 2004	50,420	3,964	203	54,587
Interest received	2,108	168	9	2,285
Balances at 31 December 2004	52,528	4,132	212	56,872

a. The Clancey bequest was donated by the late Dr P. A. Clancey with the request that it should be used to support and enhance the Club's Bulletin.

b. The Publications Fund is available to finance Club publications other than regular issues of the Bulletin.

c. The Bird Atlas of Uganda Fund is specifically to assist with financing the production and publication of the Atlas.

7. ADMINISTRATION EXPENSES include	**2004**	*2003*
	£	£
Club's share of cost of fitting out and rental of storage unit	**916**	*1,744*
Audit and Independent Examination fees	**550**	*550*
Depreciation	**162**	–
Other administration expenses	**2,179**	*2,586*
	3,807	*4,880*

8. REIMBURSEMENT OF EXPENSES

No Committee members receive any remuneration, but are reimbursed for expenses incurred by them on behalf of the Club. The amount reimbursed during the year was **£1,576** (*2003 £1,285*)

INDEPENDENT EXAMINERS REPORT TO THE TRUSTEES OF THE BRITISH ORNITHOLOGISTS' CLUB

I report on the accounts of the Club for the year ended 31 December 2004, which are set out on pages 88 to 91.

Respective responsibilities of trustees and independent examiners

The charity's trustees are responsible for the preparation of the accounts. The charity's trustees consider that an audit is not required for this year (under section 43(2) of the Charities Act 1993 [the 1993 Act]) and that an independent examination is needed.

It is my responsibility to:

- Examine the accounts (under section 43(3)(a) of the 1993 Act);
- To follow the procedures laid down in the General Directions given by the Charity Commissioners (under section 43(7)(b) of the 1993 Act); and
- To state whether particular matters have come to my attention.

Basis of Opinion

My examination was carried out in accordance with the General Directions given by the Charity Commissioners. An examination includes a review of the accounting records kept by the charity and a comparison of the accounts presented with those records. It also includes consideration of any unusual items or disclosures in the accounts, and the seeking of explanations from you as trustees concerning any such matters. The procedures undertaken do not provide all the evidence that would be required in an audit and, consequently, I do not express an audit opinion on the view given by the accounts.

Independent Examiners' statement

In connection with my examination, no matter has come to my attention:

(1) which gives me reasonable cause to believe that, in any material respect, the requirements:
  - to keep accounting records in accordance with s41 of the 1993 Act; and
  - to prepare accounts which accord with the accounting records and to comply with the accounting requirements of the 1993 Act have not been met; or

(2) to which, in my opinion, attention should be drawn in order to enable a proper understanding of the accounts to be reached.

Alan Peal ACA—Principal.
Porritt Rainey & Co. Chartered Accountants
Date: 26 April 2005

CORRIGENDA

In *Bull. Brit. Orn. Cl.* 125, the figures on pp. 35–36 were incorrectly positioned. Fig. 2 is actually that placed as Fig. 4, Fig. 3 is in fact that placed as Fig. 2 and Fig. 4 is that presently placed as Fig. 3. The captions and text were correct. The Editor apologises for any confusion that this may have caused. On p. 58 reference was made to Table 1, but this was accidentally omitted. The table appears below.

TABLE 1
Location and measurements of Buff-fronted Owl *Aegolius harrisii* specimens from Colombia.

Aegolius harrisii	Site	TC[a]	WC (mm)	TL (mm)	Tar L (mm)	BM (mm)	Oss (g)	Sex	Gonad (mm) (length x width)
IAvH 10636	PNNT	21.3	160	74.9	23.1	120	C	M	4
ICN-MHN29869	ET	23.3	143	72.1	24.6	—	—	M	—
LEP 068	SC	21.6	143.7	73.2	23.7	122.1	C	M	6.8 x 5.4
LEP 099	SC	21.3	162	82	24.1	129.4	C	F	7.0 x 3.5[b]
Ringed 1802[c]	ML	20.7	149.8	72.6	24.8	118.9	—	F	15[d]

[a] Measured from base at skull, [b] undeveloped follicles, [c] Ringed on the right leg, [d] largest follicle 2 mm. Sites: SC = San Cayetano, ML = Miralejos, ET = El Tambo, PNNT = Parque Nacional Natural Tamá. Measurements: TC = Total culmen (including cere), WC = Wing chord, TL = Tail length, Tar L = Tarsus length, BM = Body mass, Oss = Ossification (C = complete). Sex: M = male, F = female.

A new species of *Scytalopus* tapaculo from the upper Magdalena Valley, Colombia

by Niels Krabbe, Paul Salaman, Alex Cortés, Alonso Quevedo, Luis Alfonso Ortega & Carlos Daniel Cadena

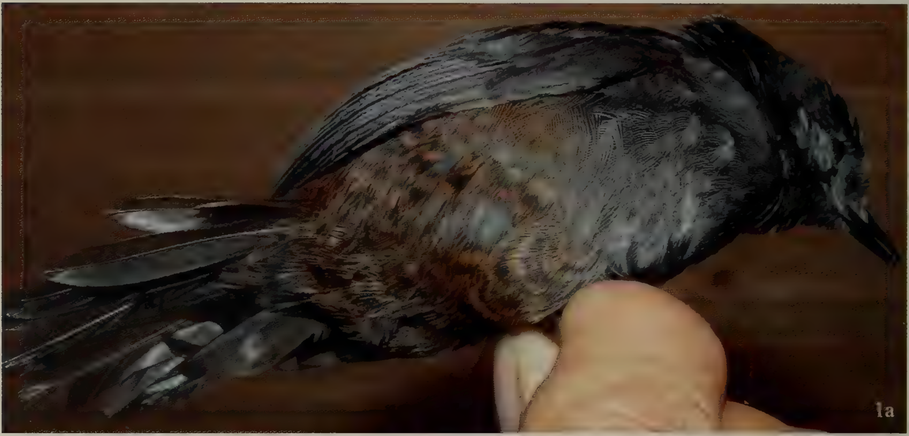
Received 19 July 2004; revision received 28 April 2005

Ridgely & Gaulin's (1980) paper on the birds of Finca Merenberg, Cordillera Central, dpto. Huila, Colombia, mentions that the authors regularly heard a *Scytalopus* tapaculo, and that they did not know to what species it pertained. In October 1986, Bret Whitney tape-recorded a *Scytalopus* at Finca Merenberg he too was unable to identify. He sent a copy of the recording to NK, who was unaware of any *Scytalopus* with a similar song. Yet, *S. atratus confusus*, a taxon that ranges at similar elevations in Colombia was a possibility, as its vocalisations were then unknown. Due to mounting political instability it became dangerous to work in the region, thus very few ornithologists visited Finca Merenberg in the 1990s. In 2002, however, Andrés Cuervo finally obtained recordings of *confusus* in dpto. Antioquia and sent copies to NK, who found the vocalisations very different from those of the Finca Merenberg birds, making it highly probable that the latter represented an undescribed taxon. By then, political tension had lessened, enabling us to visit Finca Merenberg in February 2003, with the purpose of obtaining specimens and tape-recordings of the tapaculo. Three specimens were taken, all males, whose vocalisations were also tape-recorded. Additional recordings of 5–6 individuals were obtained at Finca Merenberg and a nearby site.

The Finca Merenberg tapaculo is morphologically very similar to several other *Scytalopus*. Its main characteristic is its distinct song, as is true of several congenerics (Krabbe & Schulenberg 1997). DNA sequences generated from tissue samples were compared with those of a variety of *Scytalopus*, revealing that the bird must have been isolated for a substantial period. The vocal and genetic distinctiveness of this tapaculo convince us that it represents a new (biological) species, which we name:

Scytalopus rodriguezi sp. nov.
Upper Magdalena Tapaculo
Tapaculo del Alto Magdalena

Holotype Adult male, no. ICN-34844 of the ornithological collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia (ICN), Bogotá, Colombia (Fig. 1). Collected and prepared by NK (original no. NK3-24.2.03), on 24 February 2003, in Finca Merenberg Natural Reserve, San Agustín municipality, dpto. Huila, Colombia (02°12'N, 76°06'W). This locality is at 2,200 m on the east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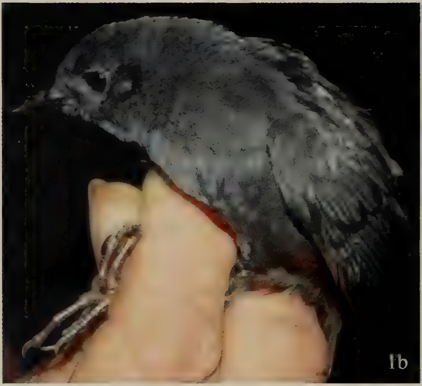
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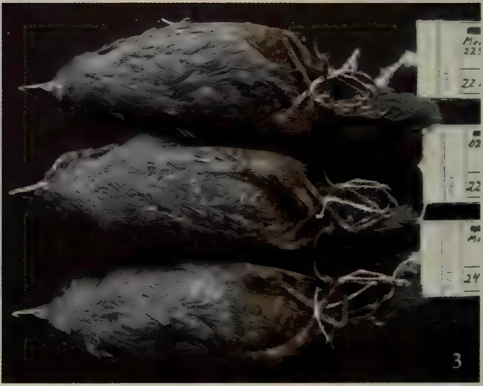
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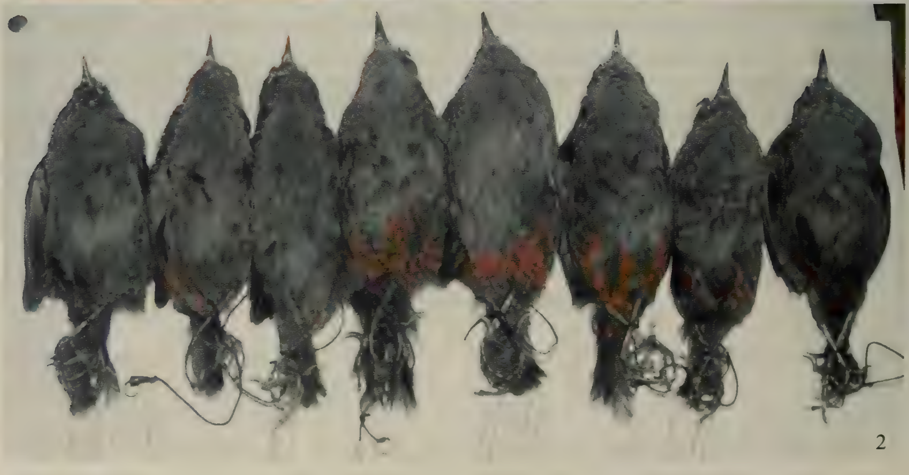
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slope of the Cordillera Central, in lower montane humid forest. The specimen was tape-recorded in dense understorey of heavily disturbed primary forest and through playback lured into a mist-net placed nearby. Sound-recordings are deposited at the British Library Sound Archive (cat. nos. 131212, 131213 and 131217); (uncatalogued) tissue samples in DMSO buffer are held at Banco de Tejidos, Instituto Alexander von Humboldt. For measurements see Table 1.

Diagnosis Song and call distinctive (see Vocalisations), but plumage typical of genus. The lack of distinguishing plumage features in many species of *Scytalopus* is depicted in Fig. 2. Medium-sized *Scytalopus* with a body mass of 21.9 g (21.4–22.7 g: see Table 1). Much like sympatric *S. spillmanni* but body mass smaller, plumage overall slightly darker, especially on lower belly and flanks, wings and tarsi shorter, and tarsi and toes darker. Also much like allopatric *S. chocoensis* and *S. robbinsi*, but body mass averages slightly larger, plumage slightly darker, especially on throat and belly, wings and tail longer, tarsi and toes darker, and bill slenderer. Decidedly smaller than allopatric *S. micropterus* in all measurements, with a distinctly slenderer bill. Smaller and less glossy than the possibly sympatric *S. atratus confusus*; also longer tailed, without a white crown spot, and lacks clearly demarcated white tips to belly feathers. Body mass much larger than near-sympatric *S. canus opacus*, wing-length the same but bill longer, tail averages slightly longer, and dark bars on flanks broader and less straight. Much like allopatric *S. stilesi*, a recently described species from further north in the Central Andes of Colombia (Cuervo *et al.* 2005), but tarsi shorter, wings shorter, tail longer, and brown flanks slightly paler. Body mass larger than the widespread and possibly sympatric *S. latrans*, plumage distinctly paler, bill and tail longer, and brown on rump and flanks much more extensive.

Description of holotype Capitalised colour nomenclature and numbers from Smithe (1975). Adult male (body mass 22.7 g) with unossified skull, no *Bursa Fabricii* and no fat; each testis 4 x 8 mm. Upperparts, wings, tail (of 12 rectrices) and head- and neck-sides Blackish Neutral Gray (82), with rump evenly barred Brussels Brown (121B); barring indistinct on upper rump. Uppertail-coverts indistinctly barred and tips of tertials indistinctly tipped dark Prout's Brown (121A); tertials very faintly washed Vandyke Brown (121). Underparts Dark Neutral Gray (83), with belly

Captions to plates on oppostite page:

Figure 1. Holotype of *Scytalopus rodriguezi* (Paul Salaman)

Figure 2. Eight Ecuadorian taxa of *Scytalopus* tapaculos, illustrating the lack of plumage characteristics as distinguishing features in the genus. From left to right: *S. canus opacus*, *S. latrans subcinereus*, *S. latrans latrans*, *S. vicinior*, *S. spillmanni*, *S. parkeri*, *S. robbinsi* and *S. chocoensis*. Specimens in Zoological Museum, Univ. of Copenhagen, all collected within the same decade (Niels Krabbe)

Figure 3. Type series of *S. rodriguezi*. From top to bottom: paratype (ICN 35234), paratype (ICN 34845), and holotype (ICN 34844). Apart from the pale tips to the belly feathers of ICN 34845, they have nearly identical underparts (Paul Salaman)

TABLE 1

Morphometrics of males of selected species of *Scytalopus*: mean and range (in parentheses). Measurements of *S. rodriguezi* and *S. atratus confusus* are from Colombia, the rest from Ecuador. See Appendix for list of specimens examined.

Taxon	Body mass (g)	Wing(flat) (mm)	Tail (mm)	Tarsus (mm)	Bill (tip to operculum fore-edge) (mm)
S. rodriguezi	21.6 (21.4–21.9) *n*=3	57.3 (57.0–58.0) *n*=3	45.0 (44.0–47.0) *n*=3	21.8 (21.5–22.0) *n*=3	7.4 (7.3–7.5) *n*=3
S. stilesi	23.0 (21.5–24.5) *n*=2	63.8 (63.0–64.5) *n*=2	42.7 (42.0–43.3) *n*=2	23.0 (22.9–23.0) *n*=2	7.8 (7.5–8.1) *n*=2
S. micropterus	29.7 (27.0–32.5) *n*=9	61.4 (59.9–64.0) *n*=15	53.5 (48.0–59.0) *n*=12	24.9 (24.3–25.4) *n*=6	7.8 (7.5–8.2) *n*=4
S. spillmanni	25.2 (21.0–30.0) *n*=36	61.9 (56.0–67.0) *n*=38	45.3 (39.0–54.0) *n*=35	24.5 (22.2–26.0) *n*=18	7.0 (6.1–7.6) *n*=14
S. canus opacus	16.2 (13.9–17.9) *n*=23	57.2 (52.0–63.0) *n*=22	42.8 (35.4–46.7) *n*=19	22.5 (20.8–24.2) *n*=27	5.5 (5.0–6.1) *n*=19
S. atratus confusus	1 male in ICN 25.0 g	58.7 (58.1–61.5) *n*=7	43.8 (42–44.8) *n*=6	23.6 (22.6–24.4) *n*=6	1 male in ICN 8.2 mm
S. robbinsi	19.6 (18.1–21.0) *n*=8	53.9 (52.0–55.0) *n*=8	36.0 (34.0–39.2) *n*=8	22.2 (22.2–22.3) *n*=4	6.9 (6.6–7.2) *n*=5
S. chocoensis	21.0 (19.0–22.5) *n*=17	55.3 (52.0–60.0) *n*=20	38.7 (33.8–40.7) *n*=19	22.2 (21.2–25.0) *n*=8	7.7 (7.5–8.1) *n*=7
S. latrans	18.2 (16.8–20.9) *n*=15	57.5 (53.0–63.0) *n*=20	39.8 (36.0–45.0) *n*=18	22.6 (20.5–24.0) *n*=12	6.4 (5.6–7.0) *n*=10

feathers indistinctly tipped pale grey; flanks, lower belly and undertail-coverts have fairly straight and *c*.1-mm wide Cinnamon (123A) and blackish bars. Axillaries Cinnamon. Irides dark brown, bill black, and feet dusky brown on outer and rear of inner surface, horn brown on rest of inner surface, with paler claws. Stomach contents consisted of the remains of small arthropods.

Description of paratypes Two additional specimens were taken at the type locality, but slightly higher, at 2,235 m (Fig. 3). Both were singing males that were tape-recorded before being lured into mist-nets using playback. One (ICN 35234) weighed 21.6 g, both testes 4 x 8 mm; the other (ICN 348425) weighed 21.4 g, both testes 2.5 x 3 mm. They are almost identical to the holotype in coloration and soft parts, differing only by a slightly more pronounced wash of Vandyke Brown on the tertials; ICN 34845 also has slightly paler and better-defined tips to the belly feathers.

Systematic relationships The taxonomic affinities of *S. rodriguezi* were assessed by CDC through analyses of mtDNA sequences as part of a broader, ongoing attempt to reconstruct a phylogeny of *Scytalopus*, which will be published elsewhere (Cadena *et al.* in prep.). Cuervo *et al.* (2005) presented preliminary results based on analyses of 315 base pairs (bp) from the cytochrome-*b* (cyt-*b*) gene for multiple

Scytalopus taxa, including all but two of the known species in Colombia and Ecuador. The dataset discussed by Cuervo *et al*. (2005) has since been expanded to include more taxa (mostly from south-east Brazil) and 650 additional bp of sequence from the second subunit of the NADH dehydrogenase gene (ND2). Analyses of this more comprehensive dataset confirm the relationships described by Cuervo *et al*. (2005), with high bootstrap support (98% under maximum likelihood and 100% under parsimony) and high Bayesian posterior probability (1.00) for a clade formed by *S. rodriguezi*, *S. robbinsi*, *S. stilesi* and an unnamed species from the Pacific slope of the Colombian Cordillera Occidental (see Cuervo *et al*. 2003). All analyses consistently indicated a basal position for *S. rodriguezi* within this assemblage, but support for the grouping of *S. stilesi*, *S. robbinsi* and *Scytalopus* sp. nov. was not strong. The clade formed by these three species received 68% and 54% bootstrap support in maximum likelihood and unweighted parsimony analyses, respectively, and a Bayesian posterior probability of 0.62.

The lowest level of genetic divergence (uncorrected *p* distance in cyt-*b*) observed between *S. rodriguezi* and another tapaculo was with *Scytalopus* sp. nov., at 5.0%. Divergence from the other two species in its clade was higher: 6.0% from *S. robbinsi* and 6.7% from *S. stilesi*. Using two available estimates of passerine cyt-*b* subsitution rates to assess the time of separation of *S. rodriguezi* leads to quite different temporal scenarios. Assuming the rate of 1.6–2.0 % divergence per million years (Tarr & Fleischer 1993, Fleischer *et al*. 1998), the data suggest that *S. rodriguezi* last shared an ancestor with its closest relatives in the Pliocene, at least 2.5 million years ago. In contrast, assuming a rate of 5.6% divergence per million years (Warren *et al*. 2003) would place its divergence in the mid Pleistocene, at *c*.1 million years before present. In either case, the sequence data indicate that *S. rodriguezi* is a relatively old taxon (Johns & Avise 1998, Johnson & Cicero 2004) that probably became isolated from its closest relatives before the onset of the large-amplitude climatic oscillations that commenced 0.8 million years ago in the Colombian Andes (Hooghiemstra & Ran 1994).

Voice Songs of eight different individuals were recorded at two localities (Finca Merenberg and Serranía de las Minas). Recordings are deposited in the British Library Sound Archive (cat. nos. 131209–131218). Most are of birds engaged in aggressive territorial defence in response to playback. Only one bird sang in each territory, although the presence of another individual, presumably the mate, was confirmed visually in at least one case.

Song, among the simplest of any *Scytalopus*, consists of a single note repeated at a pace of 4–5 per second, and is given in a single phrase, or, more commonly, in bouts of 2–5 or more phrases. During each phrase the volume most often increases gradually and the pitch rises slightly over the first 4–6 seconds, and then both remain constant (Fig. 4). Occasionally the volume fades on the last 1–2 notes, but phrase endings are usually rather abrupt. The lengths of phrases and pauses between them are irregular; phrases vary from 2 to over 60 seconds, and pauses at 2–21

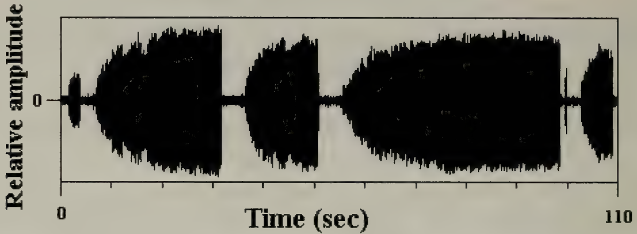


Figure 4. Relative volume of song of paratype ICN 34845 of *S. rodriguezi* during a bout of five songs (recordist Niels Krabbe). Sonogram prepared using CoolEditPro (Syntrillium Software).

seconds. Each phrase is usually initiated with a slightly lower pitched, prolonged note (Fig. 5a).

Song in response to playback is remarkably similar to that under natural conditions, showing little or no change in quality, pace, pitch and phrase length, and differs only in the briefer pauses, increased volume and, sometimes, in a more accentuated introductory note. Both the fastest and slowest songs recorded (5.3 and 4.0 notes/s) were given under natural conditions.

In six of eight songs recorded from different individuals, song notes are up/down-strokes. In two they are only down-strokes. The up-stroke and peak is a fundamental note loudest around 3 kHz (Fig. 5a,c). The long down-stroke creates a first overtone at 2.5–3.5 kHz, which in seven birds is somewhat louder than the fundamental, but in one bird is weaker (Fig. 5b). The pitch and pace recall those in

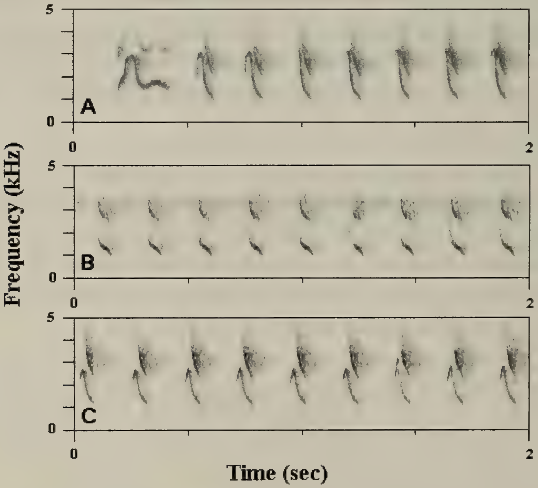


Figure 5. Songs of males of *S. rodriguezi*. **A**: paratype (ICN 34845), including the introductory note of the song. **B**: Paratype (ICN 35234). **C**: Holotype. Sonograms produced using 1024 frequency bands and CoolEditPro (Syntrillium Software).

songs of *S. robbinsi* (Fig. 6a) and *S. chocoensis* (Fig. 6b), whereas songs of *S. canus opacus* (Fig. 6c), *S. spillmanni* (Fig. 6d) and *S. stilesi* (Fig. 6e) are considerably faster. Other taxa from the Colombian Andes such as *S. vicinior* (Fig. 6f), *S. atratus confusus* (Fig. 6g), *S. micropterus* (Fig. 6h) and *S. latrans latrans* (Fig. 6i), differ from *S. rodriguezi* in the quality of their song notes, in most cases distinctly so.

Calls, given by both sexes, were single, 0.1-second-long, rising *cui* notes at 3.0–3.3 kHz terminated with a more or less accentuated, complicated *brzk* sound with many overtones (Fig. 7a–b). Except being higher pitched, calls are very similar to those of *S. robbinsi* (Fig. 7c–e), but distinctly differ from those of *S. stilesi* (Fig. 7f–h).

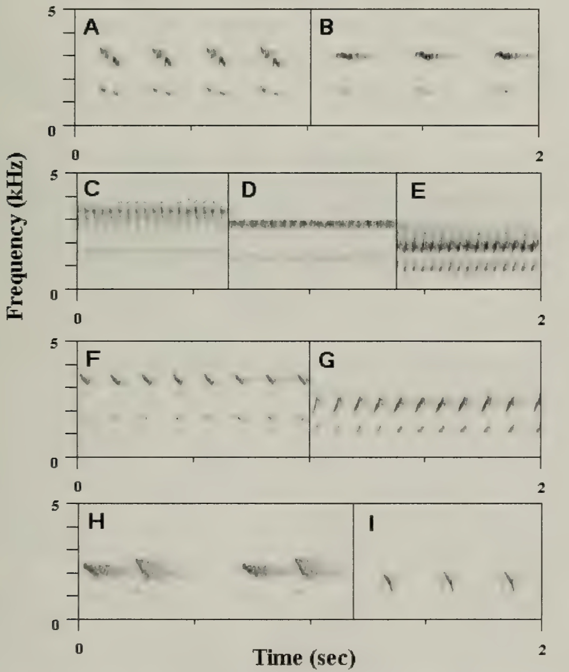


Figure 6. Songs of *Scytalopus* tapaculos (recorded by Niels Krabbe unless stated otherwise). **A**: *S. robbinsi*, Buenaventura, prov. El Oro, Ecuador, 15 April 1991. **B**: *S. chocoensis*, El Placer, prov. Esmeraldas, Ecuador, 25 October 1983. **C**: *S. canus opacus*, PN Puracé, dpto. Huila, Colombia, 17 October 1986 (recorded by Bret M. Whitney). **D**: *S. spillmanni*, Alto Gallinazo, dpto. Antioquia, Colombia, 12 June 1994. **E**: *S. stilesi*, Otún Quimbaya, dpto. Risaralda, Colombia, 2 November 1996 (recorded by L. Renjifo). **F**: *S. vicinior*, Mindo, prov. Pichincha, Ecuador, 2 December 1990. **G**: *S. atratus confusus*, Mampuestos, dpto. Antioquia, Colombia, 30 March 2002 (recorded by A. Cuervo). **H**: *S. micropterus*, PN Cueva de los Guácharos, dpto. Huila, Colombia, 21 October 1986 (recorded by Bret M. Whitney). **I**: *S. latrans latrans*, Alto Gallinazo, dpto. Antioquia, Colombia, 12 June 1994. Sonograms produced using 1024 frequency bands and CoolEditPro (Syntrillium Software).

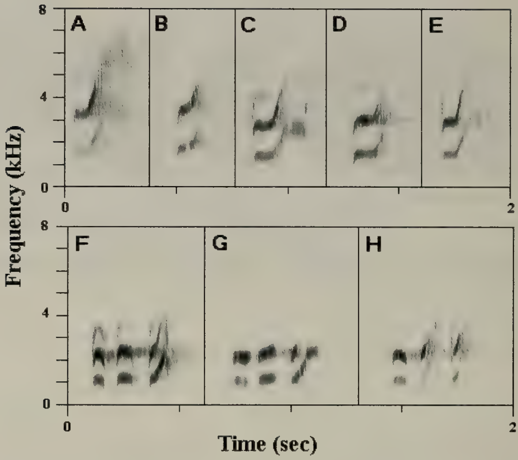
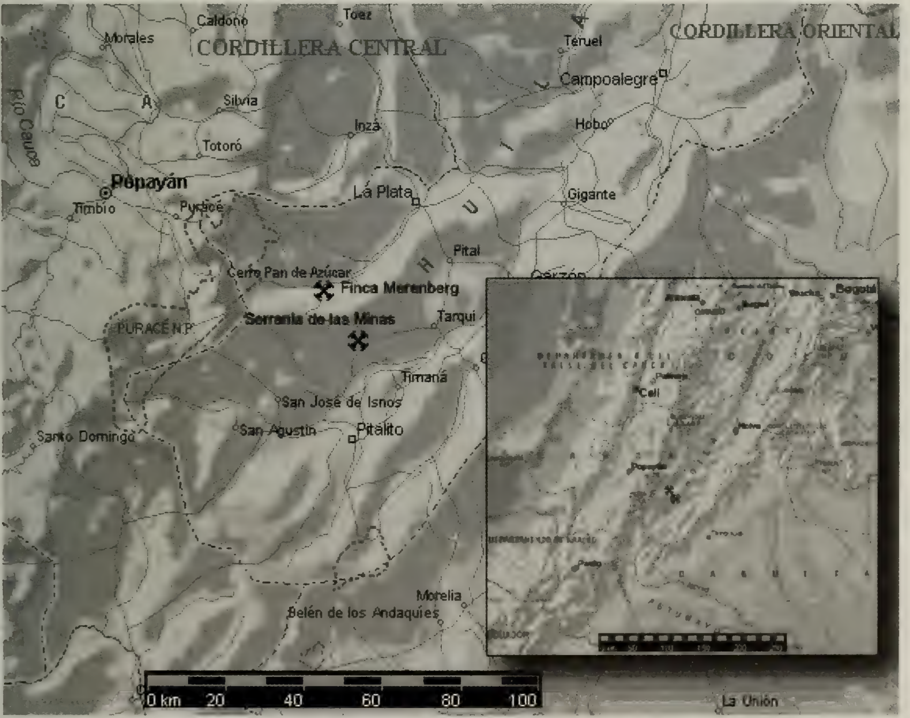


Figure 7. Calls of *Scytalopus* tapaculos (all recorded by Niels Krabbe unless stated otherwise). **A–B**: *S. rodriguezi* recorded at the type locality, A on 23 February 2003, B on 24 February 2003. **C–E**: *S. robbinsi* recorded at Buenaventura, prov. El Oro, Ecuador, C on 16 April 1991, D on 16 November 1991 and E on 26 September 1990. **F–H**: *S. stilesi*. F: Carolina, dpto. Antioquia, Colombia, April 1995 (recorded by T. Cuadros). G: Otún Quimbaya, dpto. Risaralda, Colombia, February 1999 (recorded by C. Daniel Cadena). H: Amalfi, dpto. Antioquia, Colombia, 9 January 2002 (recorded by A. Cuervo). Sonograms produced using 512 frequency bands and CoolEditPro (Syntrillium Software).

Distribution *Scytalopus rodriguezi* is currently known from two areas on the east slope of the Cordillera Central, at the head of the Magdalena Valley, at 2,000–2,300 m (Fig. 8), namely Reserva Natural Merenberg (the type locality), where recorded at 2,150–2,300 m, and Serranía de las Minas (02°05'N, 76°02'W; 2,000–2,300 m), a ridge 15 km south-southeast of Finca Merenberg. Although known only from these localities, we presume the species occurs in valleys on both sides of the Serranía de las Minas, and possibly over a slightly broader latitudinal range in dpto. Huila. However, both north and south of its presumed range, elevations of 2,000–2,300 m are extensively deforested (ESDI 2004). A raster and vector analysis of an image (NASA 2004) including the presumed range for *S. rodriguezi* (see below) and within these elevational ranges, concurs in a range of 433 km^2. However, only 169.4 km^2 or 39% is forested (ESDI 2004). Much of the 169.4 km^2 of remaining forest is heavily fragmented and therefore considered suboptimal for *S. rodriguezi* populations.

Elevational and latitudinal replacements of morphologically very similar but vocally distinctive forms are prominent in *Scytalopus*, and the sutures between them are often remarkably narrow (Fjeldså & Krabbe 1990, Krabbe & Schulenberg 1997). Exceptions include *S. latrans*, which often overlaps entirely with other species, and to some degree *S. atratus*, which shows partial elevational overlap with *S. micropterus* in much of its range (Krabbe & Schulenberg 1997). It is probable that, as in many parts of Ecuador, most slopes of the Cordillera Central of Colombia are inhabited by *S. latrans* and 3–4 species of *Scytalopus* that replace each other altitudinally. From the uppermost elevation to the lowest these are: *canus opacus*; *spillmanni*; *micropterus*, *rodriguezi* or *stilesi* (depending on latitude); and (with some elevational overlap) *atratus confusus*.

Other *Scytalopus* encountered in the type locality of *S. rodriguezi* and immediate environs include *S. spillmanni*, heard by NK at the upper limits of the Merenberg reserve (2,300 m), where it replaces *rodriguezi* sharply, and which presumably occurs up to near treeline, where it is in turn replaced by *S. canus opacus* (pers. obs. and tape-recordings by B. M. Whitney & P. Coopmans). No *Scytalopus* occurs lower down, as these areas are too deforested and dry for the genus. Further north on the east slope of the Central Cordillera *S. rodriguezi* is replaced by another recently discovered species of *Scytalopus* (Cuervo *et al.* 2005), but the zone of replacement is undetermined. We fear that *rodriguezi* is truly limited to a tiny area at the head of the Magdalena Valley (Fig. 9). To the east, on the western slope of the Eastern Cordillera and apparently also to the south on the east slope of the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Finca Merenberg
Garzón
PURACÉ N.P.
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Timaná
San José de Isnos
San Agustín
Pitalito
Santo Domingo
Morelia
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0 km 20 40 60 80 100
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Popayán

Figure 8. Map of southern Colombia, showing the distribution of *S. rodriguezi*. Crosses mark the two sites where the species has been found.

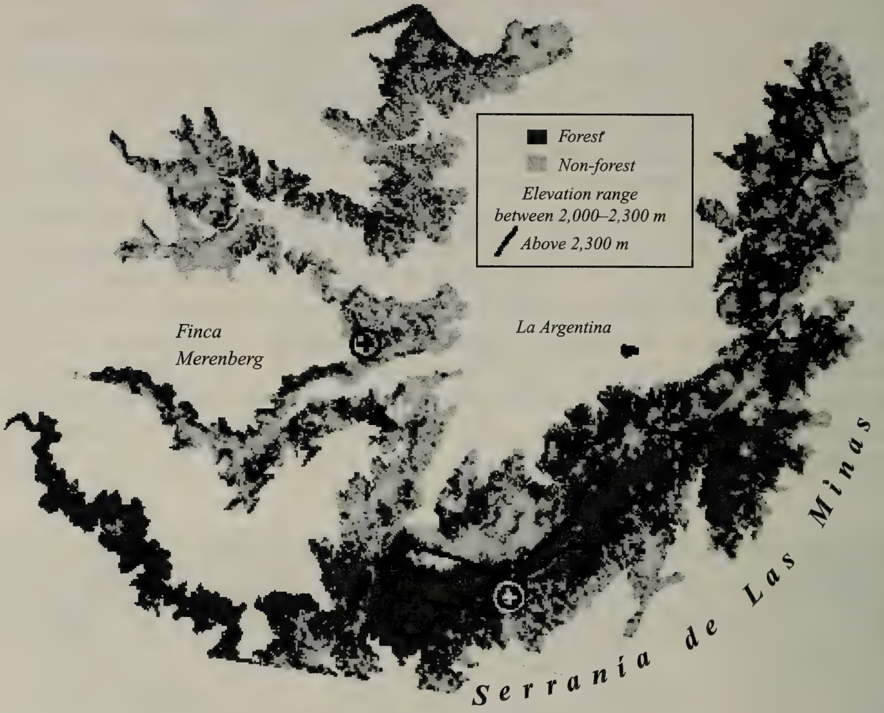

Figure 9. Present-day forest cover within the projected Area of Occupancy of *Scytalopus rodriguezi*. Except for those areas encircled in black, only elevations between 2,000 and 2,300 m are shown. Crosses mark the two sites where the species has been found. Map based on ESDI (2004) and NASA (2004).

Cordillera Central *S. rodriguezi* is replaced by *S. micropterus*, a form that occurs from 1,200 to 2,500 m (being commonest at 1,700–2,100 m), on the Amazonian slope from central Colombia to northernmost Peru (Krabbe & Schulenberg 1997). In southern Colombia *micropterus* 'spills over' the Eastern Andes to the head of Magdalena Valley, at Cueva de los Guácharos, where common at 2,000 m (own tape-recordings), and it apparently also occurs on the east slope of the Central Andes in Huila, where specimens (in the United States National Museum [USNM], Washington DC, and Natural History Museum, Tring [NHM]) that agree with *micropterus* in their long tails, large bills and general plumage pattern were collected at La Candela (2,135 m) and nearby La Palma (1,675 m). It is unknown where *rodriguezi* and *micropterus* replace each other latitudinally, but that will undoubtedly mark the northern limit of the range of *micropterus* in the Central Andes of Colombia.

In addition, two other species of *Scytalopus* occur in central Colombia. One is the widespread *S. latrans*, which is often found in heavily disturbed or secondary habitats, and which occupies a broad altitudinal range. It co-exists with a congener in many parts of its range (Krabbe & Schulenberg 1997). Strangely, we did not record this taxon at Finca Merenberg, nor can we find records of it from the east slope of the Central Andes south of Antioquia. The nearest records we have located from the Central Andes are on the west slope in Cauca (Chapman 1917), at Valle de las Papas and Almaguer. We strongly doubt that such a large gap in its distribution is genuine.

The other taxon, *S. atratus confusus*, occurs on both slopes of the Cauca and Magdalena valleys, at *c*.915–1,980 m, i.e. lower than *S. rodriguezi*. At the head of the Magdalena Valley it has so far only been recorded south of Merenberg, specimen records being from Isnos (1,600 m), La Candela (1,980 m), La Palma (1,675 m) and below Andalucía (915 m) (Chapman 1917, Zimmer 1939; elevational data taken directly from labels of specimens with a white crown spot held in the Academy of Natural Sciences Philadelphia [ANSP], American Museum of Natural History, New York [AMNH], Field Museum of Natural History, Chicago, and USNM). Like *S. latrans*, the lack of records from further north on the east slope of the Central Cordillera probably owes to under-sampling.

Etymology We take pleasure in naming the new species for José Vicente Rodríguez Mahecha, in recognition of his dedication and contribution to ornithology and conservation in Colombia. He has collected over 8,000 bird specimens that are now housed in the Instituto Alexander von Humboldt and ICN collections in Colombia, and is one of Colombia's leading conservationists. The English and Spanish names refer to the upper Magdalena Valley of Colombia to which the species is endemic.

Ecology and behaviour

Scytalopus rodriguezi inhabits dense understorey of humid forest at elevations of 2,000–2,300 m on the east slope of the southern Central Cordillera, Colombia. Annual precipitation approaches 2 m and the driest months are December–January (Ridgely & Gaulin 1980). The Finca Merenberg reserve comprises 15 forest remnants, each *c*.1 ha in size, separated and surrounded by pasture (Fig. 10). Large trees are 20–30 m tall and include *Morus insignis* (Moraceae), *Brunellia occidentalis* (Brunelliaceae), *Quercus humboldtii* (Fagaceae), *Cecropia* sp. (Cecropiaceae), *Hedyosmum recemosum* (Chloranthaceae), *Billia columbiana* (Hippocastanaceae), *Oreopanax floribundun* (Araliaceae), *Blakea* aff. *pyxidanthus* (Melastomataceae), *Allophyllus mollis* (Sapindaceae), *Ladenbergia macrophylla* (Rubiaceae), and *Clusia* sp. (Clusiaceae). Midstorey vegetation includes *Miconia cordifolia* (Melastomataceae), *Palicourea angustifolia*, *P. albiflora* (Rubiaceae), *Geonoma lindeniana* (Arecaceae), *Renealmia policarpa* (Zingiberaceae) and *Solanum venosum* (Solanaceae). Due to roaming cattle the understorey is heavily trampled and tree recruitment is poor (Fig. 11). Dense understorey of weeds and climbing plants is primarily found at forest edge and frequently includes *Cyathea*

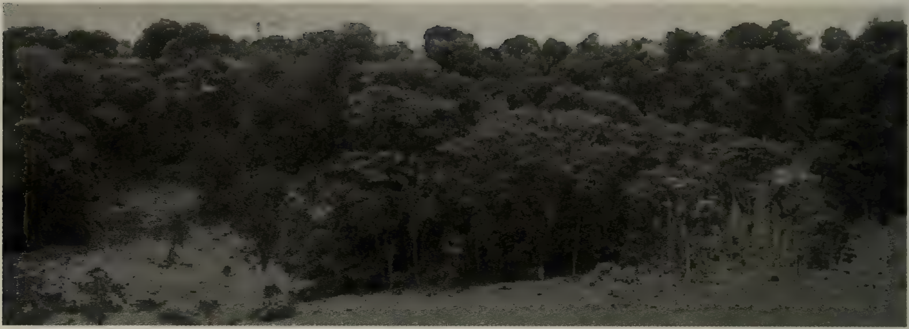

Figure 10. Humid montane forest at Finca Merenberg showing typical landscape of fragmented forest (Paul Salaman)

Figure 11 (left). Trampled undergrowth at Finca Merenberg (Paul Salaman)

Figure 12 (right). Climbing plants and weeds at forest edge at Finca Merenberg; note felled trees within the reserve (Paul Salaman)

sp. (Cyatheaceae) and *Chusquea* aff. *scandens* (Poaceae). For further details see Ridgely & Gaulin (1980).

The montane cloud forest of the Serranía de las Minas is much less disturbed than forest at Finca Merenberg, having only been subject to selective logging and is merely fragmented by the road that cuts through part of it. Trees include the dominant *Quercus humboldtii* associated with smaller trees such as *Ocotea cuneata*, *Nectandra macrophylla*, *Aniba perutilis* (all Lauraceae), *Viburnum cornifolium* (Caprifoliaceae), *Cedrella montana* (Meliaceae), *Cinchona pubescens* (Rubiaceae), *Ficus greiffiana* (Moraceae), *Billia columbiana* and *Myrcia fallax* (Myrtaceae). Understorey is well developed with high tree recruitment and dominant plants include *Weinmannia* sp. (Cunoniaceae), *Cavendishia strobilifera* (Ericaceae) and *Chusquea* aff. *scandens*.

The behaviour of *S. rodriguezi* does not appear appreciably different from that of most congeners (Krabbe & Schulenberg 1997, 2003). Accordingly, the new

Scytalopus is frequently heard and rarely seen. Individuals usually move inconspicuously within 50 cm of or on the ground in the densest understorey. Judging from stomach contents of the three specimens, the diet of *S. rodriguezi* consists exclusively of small insects, principally Coleoptera. No fruits, seeds or other vegetable matter were found. All three specimens had medium-sized testes and none was moulting, suggesting that breeding does not occur in January and February, at least.

The vocal habits of the species make it reasonably straightforward to assess population densities. Along a *c.*1 km transect at Finca Merenberg, we registered at least five territorial males and confirmed the presence of a mate in two territories. We roughly estimated that the species occupies 1–3 ha of suitable habitat, but that suitable habitat is not uniformly distributed. Within the 150 ha of forest in Merenberg reserve, we estimated only *c.*20 pairs or territorial males.

Conservation

Scytalopus rodriguezi is currently known from Merenberg reserve, the first protected area to be established in Colombia. Upon the reserve's establishment in 1950, by the Buch family, it comprised *c.*150 ha of forest and *c.*150 ha of cattle pasture. Unfortunately, the 150 ha of forest are dwindling (Fig. 12), partly owing to the creation of more pasture by the owners (second-generation Buch), partially to selective forest clearance of hundreds of mature oak and other hardwoods, which has drastically changed the forest physiognomy. In view of the deterioration in the site's conservation, we are most concerned about the uncertain future of Merenberg reserve. International and local non-governmental involvement and support in conservation efforts are acutely required. For example, the area deserves Important Bird Area status. Merenberg is accessible by road from Popayán and Neiva, so there is potential for ecotourism, although this is difficult at present given Colombia's ongoing military conflict. We very much hope that the discovery of this new species endemic to the region will lead to increased efforts to protect Merenberg.

The Area of Occupancy of *S. rodriguezi* is <3 km^2 at two sites. We estimate the Extent of Occurrence to be 169.4 km^2, calculated from the area of extant forest within the species' projected range (see Distribution) and 20 pairs per 150 ha, as seen in the fragmented forest of Merenberg reserve (see Ecology and behaviour), giving a total population of 2,200 territorial males or possible pairs in remaining forest. We speculate that the effects of fragmentation and continued deforestation in recent years, particularly in the Serranía de las Minas, have significantly reduced the species' total population. Only 150 ha of forest are protected at present, or just 0.3% of the species' postulated range. Based on remaining forest cover (Fig. 9), the species' stronghold is undoubtedly Serranía de las Minas, but this area is unprotected.

Since the species' discovery, an important conservation initiative has been underway at Serranía de las Minas. Together with the national parks authority (Unidad Administrativa Especial Sistema de Parques Nacionales Naturales, Dirección Territorial Surandina), Fundación ProAves and local communities hope to establish a conservation area across the Serranía de las Minas in the near future, protecting *c.*10,000 ha of premontane and montane forest, largely oak-dominated, and thereby ensuring the survival of an additional population of *S. rodriguezi*.

Scytalopus rodriguezi presently faces a risk of extinction and is therefore recommended for IUCN Red List status as Endangered, B1a+b (ii, iii, iv, v) because its presumed Area of Occupancy is less than 170 km^2 and its known population is small (<5,000 individuals).

Further studies to determine the distribution and population size of *S. rodriguezi* are a high priority, and would greatly assist the development of a specific management plan for Merenberg and, especially, Serranía de las Minas. Research and conservation initiatives in the region should also focus on several other globally threatened or range-restricted birds, e.g. *Pyrrhura melanura chapmani*, *Atlapetes fuscoolivaceus* and *Leptotila conoveri*. Further ornithological surveys are needed of remaining montane forest tracts at the head of the Magdalena Valley in order to assess the true distributions of these forms and the threats to their habitats.

Acknowledgements

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APPENDIX

Male *Scytalopus* specimens examined. Museums as follows: Academy of Natural Sciences, Philadelphia (ANSP), American Museum of Natural History (AMNH), Field Museum of Natural History (FMNH), Instituto de Ciencias Naturales, Bogotá (ICN), Museo Ecuatoriano de Ciencias Naturales (MECN), and Zoological Museum, University of Copenhagen (ZMUC).

Scytalopus rodriguezi: Colombia: 3 Huila (type series in ICN).
Scytalopus stilesi: Colombia: 2 Antioquia (ICN).
Scytalopus robbinsi: Ecuador: 2 Azuay (ZMUC, ANSP), 6 El Oro (ZMUC, ANSP, MECN).
Scytalopus chocoensis: Ecuador: 17 Esmeraldas (ZMUC, ANSP, MECN).
Scytalopus sp. nov. 1: Colombia: 1 Risaralda (ICN).
Scytalopus spillmanni: Ecuador: 3 Carchi (ZMUC), 8 Imbabura (ZMUC), 12 Pichincha (ZMUC, ANSP, MECN), 3 Sucumbios (ZMUC), 9 Napo (ZMUC, MECN), 2 Tungurahua (ZMUC), 1 Azuay (ZMUC); Colombia: 3 Antioquia (ICN).

Scytalopus micropterus: Ecuador: 8 Napo (ZMUC, ANSP, MECN), 1 Zamora-Chinchipe (ANSP).
Scytalopus atratus confusus: Colombia: 5 Huila (FMNH, AMNH, ANSP), 2 Valle del Cauca (AMNH).
Scytalopus canus opacus: Ecuador: 11 Carchi (ZMUC, ANSP), 8 Napo (ZMUC, ANSP), 2 Azuay (ZMUC, MECN), 9 Zamora-Chinchipe (ZMUC, ANSP, MECN).
Scytalopus latrans latrans: Ecuador: 3 Carchi (ZMUC, MECN, ANSP), 2 Sucumbios (ZMUC, MECN), 2 Imbabura (ZMUC), 5 Pichincha (ZMUC, MECN), 4 Cotopaxi (ZMUC), 1 Cañar (ZMUC), 3 Napo (ZMUC, MECN).

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Clytoctantes (*atrogularis*?) in Amazonas, Brazil, and its relationship to *Neoctantes niger* (Thamnophilidae)

by Bret M. Whitney

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The Rondonia Bushbird *Clytoctantes atrogularis* ranks among the most poorly known of all Thamnophilidae, having remained something of a mystery since its discovery in 1986. It is known from a single, adult female specimen, and two sightings of presumed adult males, all from Cachoeira Nazaré, Rondônia, Brazil (Lanyon *et al.* 1990). On 20 July 2004, I located a pair of *Clytoctantes* bushbirds, presumably *C. atrogularis*, on the left bank of the upper rio Sucunduri, Amazonas, Brazil (06°53'S, 59°04'W), *c.*460 km north-east of Cachoeira Nazaré. This locality was several km above the point where highway BR-230 (the Transamazônica) crosses the Sucunduri. As I walked through a belt of dense secondary growth running between tall, undisturbed *terra firme* forest and a manioc plantation shortly before dusk, I was alerted by a vocalisation strongly reminiscent of a frequently delivered call of *Neoctantes niger* (Black Bushbird). I tape-recorded the vocalisation on a Sony TCM-5000 recorder, using a Sennheiser ME-67 cardioid microphone. Before playing the recording, I moved closer and found a pair of *Clytoctantes* bushbirds foraging in dense, low vegetation. They were undisturbed by my close presence, but the tangled vegetation and waning light hampered observation. The female (chestnut bird) was seen well. It closely matched the description of the holotype (Lanyon *et al.* 1990) and my own notes on that specimen taken on a visit to the Museu de Zoologia da Universidade de São Paulo (MZUSP), where it is housed, except that the black of the throat appeared to extend further on to the side of the face near the eye, and the outer remiges on the folded wing seemed contrastingly darker than on the holotype. The male looked entirely black but was not seen sufficiently well to allow further description.

During *c.*3 minutes of observation, the birds stayed within about 5 m of each other, with the female following the male a few seconds after the latter made short flights between foraging stations. The male foraged from *c*.20 cm above ground to as high as about 2.5 m, hammering loudly (sounding like a small woodpecker) on the rachis of a large (>2 m long), dead *Heliconia* sp. leaf for several seconds, and at the broken tip of a dead branch *c*.2 cm in diameter; unfortunately, the bird was never clearly visible because of intervening vegetation. Both the male and female performed a short, stiff, lateral jerk of the tail, which was then held at the canted position for *c*.0.5 second before being twitched again in a short, slightly upward or downward direction, back toward the other side of the body, ranging through an arc of *c*.60° in the course of several seconds.

The birds showed little interest in playback of the recording of their own vocalisation. This call was a fairly loud, multi-syllabic, tremulous whistle becoming slightly protracted and fainter at the end, the whole lasting a little less than 2 seconds (Fig. 1a). It was given two or three times when the birds were initially startled by my sudden appearance but not subsequently, after they had become aware of my actions; it is best classified as an alarm call. No other vocalisation was heard. A vocalisation of *Clytoctantes atrogularis* was described by D. F. Stotz *in* Lanyon *et al.* (1990) as 'a very loud, trilled whistle, 'tree-tree-tree,' at irregular intervals.' I suppose that the alarm call I recorded could be so transcribed.

Bushbird relationships

Lanyon *et al.* (1990) remarked on the close relationship between *C. atrogularis*, *C. alixii* (Recurve-billed Bushbird) and *Neoctantes niger*. Their analysis was limited to external morphological similarities that they judged to be homologous, particularly the shared bill shape in which the mandible is strongly recurved, with the subterminal tomial notch displaced above the basal portion of the commisure. They also provided a map of the general distributions of these species. There appear to have been no more recent records of either species of *Clytoctantes*; the distribution of *Neoctantes niger* was updated by Zimmer & Isler (2004), the main change being addition of some records from south-west Amazonia and one from the west bank of the middle rio Madeira. Although the two genera are allopatric as far as is known, I would not be surprised to learn that they are at least narrowly sympatric (but perhaps not syntopic) in the poorly studied Madeira–Tapajós interfluvium.

Zimmer & Isler (2004) considered 'relationships uncertain' (presumably with other species-groups) for the two species of *Clytoctantes* and *Neoctantes*. I concur with Lanyon *et al.* (1990) that all these species and the two genera are quite closely related. In addition to the shared morphological characters documented by those authors, *Clytoctantes atrogularis* and *Neoctantes* exhibit remarkable similarities in their alarm calls (Fig. 1), which they typically give 1–3 times in the presence of a potential threat (such as approach of a person). This vocalisation possesses a nearly symmetrical, very rapidly repeated oscillation through a wide frequency band (*c*.1 kHz [*n*=6] for *N. niger* and 1.7 kHz [*n*=1] for *C. atrogularis*), and is further characterised by multiple, short bursts that increase in duration toward the end of the vocalisation while losing amplitude, the whole lasting 1.5–2.0 seconds. Structure and auditory quality of this call are unique in the Thamnophilidae. The alarm call of *Clytoctantes alixii* has not been recorded, but will almost certainly prove to be very similar.

The loudsong of both species of *Clytoctantes* is unknown, but it is likely, I predict, to be reminiscent of the loudsong of *Neoctantes niger*, which is a monotonous, steadily paced series of short, clear, whistled notes centred between *c.*1.5 and 1.8 kHz (Fig. 1c; also see Isler & Whitney 2002, disc 1: 46). Although *Neoctantes niger* is monotypic (Zimmer & Isler 2004), it displays some geographically structured variation in its loudsong, with birds north of the río

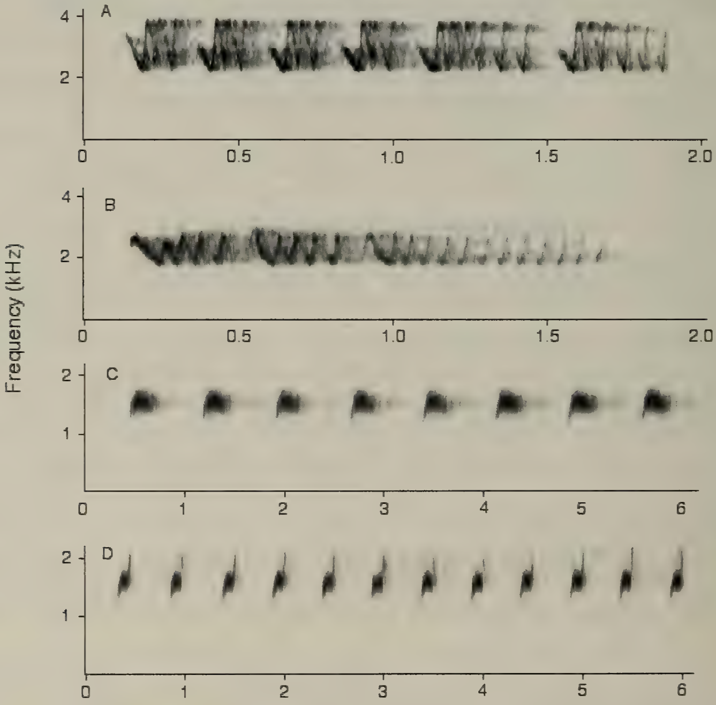

Figure 1. Some vocalisations of *Clytoctantes* and *Neoctantes* bushbirds. (A) *C. atrogularis* alarm call (Brazil: Amazonas; rio Sucunduri); (B) *N. niger* alarm call (Peru: Loreto; Quebrada Sucusari, right bank lower río Napo); (C) *N. niger* loudsong (Peru: Loreto; Quebrada Sucusari, right bank lower río Napo); (D) *N. niger* loudsong (Peru: Loreto; lower río Javarí). Original recordings (all by BMW) made on Sony TCM-5000 recorders with Sennheiser ME-80 (C) and ME-67 (A, B, D) shotgun microphones on Maxell Type II 60-minute tape. Spectrograms generated with Canary 1.2.4 of the Bioacoustics Research program of the Cornell Lab. of Ornithology, Ithaca, New York, using default settings and 92% overlap. All recordings are archived at the antbird research archive of Morton & Phyllis Isler, Alexandria, Virginia.

Marañón/rio Solimões singing significantly slower than birds south of the river (noticeable in the field without resort to spectrographic analysis), and duration of individual notes appears to average somewhat longer (compare Fig. 1c and d; most individuals may not be this different, although some are even more different). In the case of *N. niger*, birds recorded immediately after tape playback appear to deliver the loudsong at a slightly faster pace (shorter inter-note intervals; pers. obs.); thus, measurements of loudsong characteristics should be made from natural (unsolicited) songs or from steadily paced, middle sections of songs given several minutes after playback, when birds have resumed a natural rhythm. The structure of notes may also differ slightly; further study of geographic variation in *Neoctantes niger* is in progress.

As has been described for *Clytoctantes alixii* (summarised by Zimmer & Isler 2004) and *C. atrogularis* (Lanyon *et al.* 1990; this report), *Neoctantes niger* forages by gleaning, hammering and probing, mostly in soft, often decaying stems, vines and thin trunks. Subsurface foraging manoeuvres were described by Zimmer & Isler (2004) as 'using the bill to hammer repeatedly at a branch, woody vine, palm rachis, or rotten log until a hole is opened; then uses the uniquely shaped bill as a wedge to pry loose strips of live bark or stem fibres, or to flake off dead bark, afterwards picking repeatedly at small subsurface prey'. This is a good general description, although prying loose of live bark and stem fibres by *N. niger* must be a rare behaviour, as I have never observed it during numerous encounters with the species. I believe one of the most common subsurface techniques is hammering into a soft, usually dead stem, followed by forceful, side-to-side motion of the head as the bill is wedged forward, opening a slit to expose the hollow centre of the substrate, from which small arthropods are extracted as they become exposed. Such slits (Fig. 2) may exceed 30 cm in length. *Neoctantes niger* shares the distinctive, sideways-twitching tail motion described above for *C. atrogularis*, and does it frequently while foraging. Although this shared tail motion has not been described previously for either genus, it is unique in the Thamnophilidae except, perhaps, for

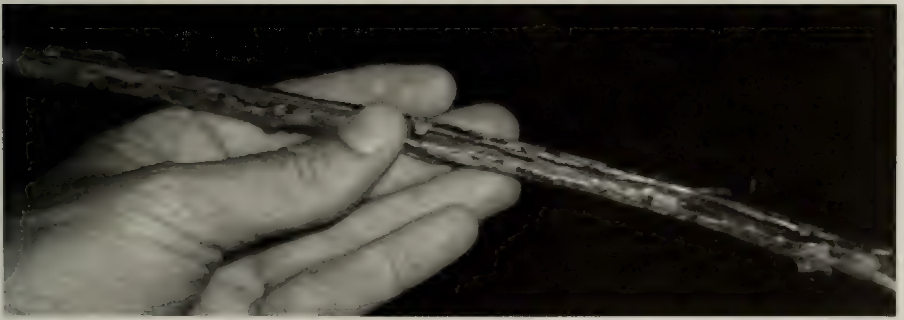

Figure 2. Dead stem opened by a male *Neoctantes niger* in search of endophytic arthropods, photographed immediately after the bird had left the area; left bank of the lower río Javarí, Loreto, Peru, August 2004 (Bret M. Whitney)

the similar but slighter tail motions of some *Myrmotherula* antwrens (e.g., Ihering's Antwren *M. iheringi* and Rio Suno Antwren *M. sunensis*: pers. obs.).

Morphological, vocal and behavioural homologies provide a convincing body of evidence that, in the context of the Thamnophilidae as a whole, *Neoctantes* and *Clytoctantes* are sister taxa. An argument could be made for subsuming *Clytoctantes* in *Neoctantes* but, absent evidence from molecular analysis that *Neoctantes niger* falls between the two species of *Clytoctantes*, which seems quite unlikely, I recommend that the two genera be maintained based on the morphological distinctions identified by Lanyon *et al.* (1990), at least. Relationships of the bushbirds to other genera in Thamnophilidae are obscure and will probably be elucidated only by well-corroborated phylogenetic analysis of the entire family.

Conservation

Assuming that the birds I found on the rio Sucunduri of southern Amazonas are the same as *C. atrogularis* from Rondônia, it is now apparent that the distribution of *C. atrogularis* covers a significant area of south-central Amazonian Brazil. It occurs in man-made second-growth and probably evolved in successional forest habitats. It is to be expected throughout the area between the two known localities and should be sought throughout Amazonia in *terra firme* forest edge, regrowth and naturally successional forest habitats. Its centre of distribution is probably the upper rio Madeira/Tapajós interfluvium.

Until information to the contrary becomes available, observers should listen for *Neoctantes*-like songs and perhaps attempt to elicit response from a bushbird with tape-playback of *Neoctantes*; I will send a copy of the alarm call of *Clytoctantes* recorded on the rio Sucunduri by e-mail attachment (360 kb) on request (if the recording is then copied for others, please forward this information to me).

Fortunately, the dam project designed to flood the Cachoeira Nazaré area was abandoned (*contra* Zimmer & Isler 2004), and there is apparently no active plan to complete it, although other dam-building projects in Rondônia are apparently moving forward (Fearnside in press). It is greatly encouraging that the state government of Amazonas, Brazil, as part of its Programa Zona Franca Verde, has just signed into law (17 February 2005) the creation of a mosaic of nine conservation areas covering 3,070,058 ha of mostly forested land in the south of the state. More than half of this area is in the heretofore greatly neglected Madeira/Tapajós interfluvium. Most of the new reserves will be open to sustainable use of some sort, but the Parque Estadual do Sucunduri, at more than one million ha, and Parque Estadual do Aripuanã (nearly 370,000 ha) should remain in a completely natural state, protecting some of the most biologically important lands on Earth (see www.sds.am.gov.br/noticia.php?xcod=943). Brazil's federal government will purportedly soon announce the creation of further large conservation units in the region.

BirdLife International (2004) currently lists the conservation status of *Clytoctantes atrogularis* as Critical. For the present, however, I suggest that the species be reverted to its prior conservation status of Data Deficient (Stattersfield *et al.* 1998). Despite ongoing deforestation in the southern part of the range, *C. atrogularis* may actually benefit somewhat from the opening of forested areas.

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The nest, eggs and incubation behaviour of Sickle-winged Guan *Chamaepetes goudotii fagani* in western Ecuador

by Harold F. Greeney

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Sickle-winged Guan *Chamaepetes goudotii* ranges from Colombia to Peru and northern Bolivia (del Hoyo *et al.* 1994). In Ecuador there are two subspecies, *tschudii* in the east and *fagani* in the west (Delacour & Amadon 1973, Ridgely & Greenfield 2001). Ridgely & Greenfield (2001), however, noted the possibility that *fagani* deserves species rank.

Though Delacour & Amadon (1973) described Sickle-winged Guan as feeding 'much on the ground' and commonly descending from trees, my own experience in both eastern and western Ecuador, and those of other authors, is that it is primarily arboreal, often being seen foraging in small groups at dusk and dawn (Hilty & Brown 1986, Ridgely & Greenfield 2001). However, I have seen the species descend to the ground to drink from standing water along roadsides in the early morning and late evening.

In Colombia, Hilty & Brown (1986) reported birds in breeding condition and females with single, dependent young in June. Sclater & Salvin (1879) described the egg as white and finely pitted, but nothing has been reported on the incubation behaviour or, apparently, the nest. Here I describe the nest, eggs and incubation rhythms, from dawn to dusk, at a nest of *C. goudotii fagani* in western Ecuador over the course of four days.

Methods

All observations were made on 20–23 August 2003 at the Mindo Biological Station (00°04'S, 78°43'W) in the Mindo Valley of north-west Ecuador. The station is at 1,600 m with the area immediately around the station and nest site consisting of heavily disturbed forest and pasture in a small, 30-ha valley surrounded by primary cloud forest. Terrain is typically rugged for this elevation in the Andes, with vegetation characterised by high epiphyte density and a canopy height of 25–35 m.

The nest was found incidentally during casually walked transects to observe birds, whilst visiting the biological station on 19–24 August 2003. Eggs were measured using metallic field callipers sensitive to the nearest 0.1 mm.

Results

On 20 August 2003, at 0645 h, an adult Sickle-winged Guan was flushed from its nest, which contained two dull white eggs. The eggs were heavily stained with dark red-brown smears of what was possibly blood and fluid from the female. They measured 74.4 mm by 50.0 mm and 70.2 mm by 51.2 mm respectively. The nest was situated 2.3 m above ground, atop a clump of large bromeliads (*Guzmania* sp.). The eggs were in the bottom of a shallow depression formed by the leaves of 2–3 bromeliads, measuring *c.*20–25 cm in diameter and lined with dead leaves and small sticks. It is difficult to be sure if these materials collected there naturally or were brought by the adults. The supporting tree was *c.*30 cm in diameter at breast height and *c.*15 m high. A 3-m-wide road passed immediately adjacent to the nest on one side, and terrain on the other sloped into dense, tangled second growth. Adults flushed from the nest when observers were *c.*6–10 m away and flew immediately into the dense vegetation, hopping from perch to perch making the high-pitched alarm call (*keeeeeee-uk!*) described by Hilty & Brown (1986). After a few minutes they would quietly leave the area.

On 20 August a video camera was placed on a tripod 4 m from the nest. Unfortunately, the nest location was such that tapes could not be changed without flushing the adult from the nest. The nest was filmed from 0915 h to 1715 h on 20

August and from 0545 h to 1815 h on the three subsequent days. I was unable to determine if both sexes incubated. Generally, the adult on the nest sat very still, occasionally peering about with jerky movements of the head. Periodically it would stand and lower its head into the nest, gently drawing its head backwards, which was likely a turning of the eggs. During these brief periods while it was standing, the adult would also occasionally peck sharply into the nest or arrange a stick briefly. On several occasions, while its head was out of sight in the nest, the adults' whole body was seen to vibrate. I interpret this behaviour as the 'tremble thrusting' or 'rapid probing' described by previous authors (Dobbs *et al.* 2003, Haftorn 1994, Greeney 2004), which is likely a method of parasite removal or possibly egg turning.

On 20 August, after being flushed while the camera was set up at 0915 h, an adult did not return to the nest until 1415 h. This adult remained on the nest for three hours until the camera was taken down. During the subsequent three days of filming, I could discern no apparent pattern in the rhythm of adult attendance. The first break off the nest (off-bout hereafter) occurred around 0600 h, and the final sitting on the nest (on-bout hereafter) for the night was initiated between 1710 h and 1810 h. Only four complete on-bouts and four complete off-bouts were recorded. Complete on-bouts averaged (±SD) 86.1 ± 73.4 minutes and complete off-bouts averaged 87.5 ± 121.0 minutes. Otherwise, including on and off-bouts interrupted or initiated by tape changes, on-bouts averages per day ranged from 79.6 ± 47.3 minutes on 21 August to 133.3 ± 34.9 minutes on 22 August. Average off-bouts for the day ranged from 78.5 ± 81.1 minutes on 22 August to 107.6 ± 110.9 minutes on 21 August. Total coverage of the eggs from 0600 h to 1800 h was 34.1%, 40.2%, 56.4% and 49.9% for each of the days. The longest off-bout was on 20 August for 310 minutes, but each day included a period of at least 189 minutes.

Discussion

Whilst the changing of cassettes (three times per day) flushed the incubating adult, and this effected the observed numbers, the overall pattern of incubation was so arhythmic that it is hard to ascertain the effect, if any, on natural incubation rhythms. It is more likely that the eggs had been recently laid and regular rhythms had not yet commenced. The eggs observed here are of similar size to those measured by Sclater & Salvin (1879) from central Colombia, presumably of the subspecies *goudotii* following distributions given by Delacour & Amadon (1973). Notwithstanding having worked at an east Ecuadorian Andes site for over four years, I have not yet encountered a nest of the Sickle-winged Guan (*tschudii*), despite the species' abundance there. This suggests that the nest studied here may be abnormally low or may reflect natural history differences between the two subspecies. I encourage others to report observations that would further elucidate reasons for this possible difference.

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The types of nightjars (Caprimulgidae) described by Sir Andrew Smith in the *Illustrations of the zoology of South Africa*

by Nigel Cleere

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Some of the earliest and most important explorations of the avifauna of southern Africa were undertaken by Dr (later Sir) Andrew Smith's expeditions between 1828 and 1829, 1832 and between 1834 and 1836 (Kirby 1965). Most of the new birds discovered during the latter expedition were described in a report to subscribers, although no nightjars were included (Smith 1836), and many of Smith's specimens were later sold at auction in London (Salvin 1880). Unfortunately, records of the dispersal of Smith's specimens were destroyed during the Second World War (Kirby 1965).

Smith (1845) described three new species of nightjar, *Caprimulgus natalensis*, *Caprimulgus rufigena* and *Caprimulgus lentiginosus* (now = *Caprimulgus tristigma lentiginosus*). They featured on plates 99–102 with accompanying text, in part 22 of the *Illustrations of the zoology of South Africa*, which appeared in March 1845 (Waterhouse 1880, Barnard 1950). In this work, Smith added footnotes to his descriptions, stating how many specimens he had in his possession and the localities or regions in which they had been collected.

Many of Smith's specimens, including a type of *C. natalensis,* were apparently sold to the British Museum (Sharpe 1906). However, the museum's registers list single types of *C. natalensis*, *C. rufigena* and *C. lentiginosus* as having been presented to the museum by Smith and their registration numbers suggest that they were received in 1848. The destination of Smith's remaining nightjar types does not appear to have been documented at the time of their dispersal. Salvin (1880) noted that some of Smith's South African specimens were prepared by the Verreaux brothers and were identifiable by their somewhat flattened posture and by a numbered brown paper label attached to one of the legs. However, Sharpe (1906) stated that Smith's collections were mounted and prepared by Jules & Alexis Verreaux.

Published type catalogues (Stone 1899, Warren 1966, van den Hoek Ostende *et al.* 1997) reveal that the locations of Smith's nightjar types are uncertain, and thus I now examine the issue in more detail.

Materials and methods

I visited most of the major natural history museums in Europe and North America and carefully examined all specimens of *Caprimulgus natalensis*, *Caprimulgus rufigena* and *Caprimulgus lentiginosus*. I compared their data with the literature, museum registers and archive material where available. In the text, the following acronyms are used: The Natural History Museum (formerly The British Museum of Natural History), Tring, UK (BMNH); The Academy of Natural Sciences, Philadelphia, USA (ANSP) and the National Museum of Natural History, Leiden, Holland (RMNH).

Caprimulgus natalensis

In Smith (1845), a male was illustrated on plate 99 and a description was provided in the accompanying text. Smith also noted the colours of the female as being similar to those of the male but not so deep or so bright. In a footnote, Smith revealed that the two specimens that he had in his possession were the only birds that he had seen and that they had been shot at dusk in the vicinity of Port Natal (now Durban). Smith visited Port Natal in 1832 (Clancey 1964, Kirby 1965).

Hartert (1892) listed two specimens, g and h, Port Natal, Sir A. Smith, as types of the species, but both are given as males. In Warren (1966), one syntype is listed as BMNH 1848.3.31.1 (relaxed mount), an adult male near Port Natal collected and presented by A. Smith, and the other syntype is recorded as being in the same collection. This second specimen is BMNH 1846.10.24.6 (relaxed mount), an unsexed adult (= female based on Cleere 1998), collected at Port Natal and purchased from Argent, who was a dealer based in London (Sharpe 1906). Attached to the legs of this second specimen are two labels. One is a small British Museum metal tag, numbered 46.10.24.6, and the other is a small, brown paper label with the number 63a.

Stone (1899) listed as a cotype (a term no longer recognised by the International Commission of Zoological Nomenclature 1999) ANSP 21.884, a female from Port Natal that was presented to the Academy by Dr T. B. Wilson and was formerly in the Rivoli (Massena) collection, which was purchased in 1846. It had been marked 'Type de Smith' by J. Verreaux and was numbered Verreaux 2826. Finally, van den Hoek Ostende *et al.* (1997) listed RMNH 88383, an adult male collected Port Natal, South Africa by J. A. Wahlberg, as the holotype.

Caprimulgus rufigena

In Smith (1845), a male was illustrated on plate 100 and a description was provided in the accompanying text. Smith also stated that the colours of the female were unknown. In a footnote, he noted that he had procured six males during his residence in South Africa, but no females, and that the species was chiefly found in the eastern districts of the colony.

Hartert (1892) listed two adult males, specimens z and a, that had been collected at Cape of Good Hope by Sir A. Smith, but failed to record either as types. In Warren (1966), one syntype is listed as BMNH 1838.3.13.3, adult male (relaxed mount), Cape of Good Hope, collected and presented by A. Smith. She also noted that four of the six syntypes were in the Academy of Natural Sciences, Philadelphia. The registration number is an error, the number actually being 1848.3.13.3.

Stone (1899) listed four cotypes (see above) as ANSP 21.830, male, Cape of Good Hope; ANSP 21.831, female, Cape of Good Hope; ANSP 21.834, juvenile male, Cape of Good Hope; and ANSP 21.835, male, Cape of Good Hope. All were presented to the Academy by Dr T. B. Wilson and were formerly in the Rivoli (Massena) collection. They were all marked 'Type de Smith' by J. Verreaux.

Caprimulgus lentiginosus

In Smith (1845), a female was illustrated on plate 101 of *Illustrations of the zoology of South Africa* and a description was provided in the accompanying text. Smith also stated that the colours of the male were unknown. In his footnote, he confirmed that only two individuals were in his possession and that they had been procured in Great Namaqualand. Smith travelled to Great Namaqualand in 1828 (Kirby 1965).

Hartert (1892) listed specimen c, an adult female collected in South Africa by Sir A. Smith as a type of the species. In Warren (1966), one syntype is listed as

BMNH 1848.3.31.2, adult female, Great Namaqualand 1834–1836, collected and presented by A. Smith. She also noted that the other syntype was in the Academy of Natural Sciences, Philadelphia. The date given by Warren is obviously an error and should be 1828.

Stone (1899) listed as a cotype (see above) ANSP 21.839, a female from Cape of Good Hope that was presented to the Academy by Dr T. B. Wilson and was formerly in the Rivoli (Massena) collection. It had been marked 'Type de Smith' by J. Verreaux and was numbered Verreaux 2889.

Discussion

It is clear from the above data that some of the specimens do not agree well with the descriptions given by Smith (1845), that there are more specimens of *C. natalensis* published as types than Smith actually collected. Determination of Smith's nightjar types is further hampered by the lack of adequate data accompanying some of the specimens.

It seems reasonable to assume that, where appropriate, specimens collected by Smith and presented by him to The Natural History Museum are genuine types, and a single specimen of each nightjar has been registered as such (Warren 1966). These specimens were erroneously listed as having been purchased and their registration numbers were given as 1848.3.21.1–3 instead of 1848.3.31.1–3 (Sharpe 1906). Most of Smith's nightjar types, however, were reported to be in The Academy of Natural Sciences, Philadelphia (Stone 1899). They had been marked 'Type de Smith' by Jules Verreaux and were in the Rivoli (Massena) collection when it was purchased by Dr T. B. Wilson in 1846 and presented to the Academy. It is known that when some of the early French collectors annotated their specimens with the word type, they simply meant that it was typical of the species, but 'Type de Smith' may suggest an actual type. In the catalogue of the Rivoli collection, none of Smith's new nightjars is listed by name, although the section on *Caprimulgus* finishes with 'Plus 45 individus formant 19 espèces indéterminées ou inédites de diverses localités' (Verreaux 1846). Verreaux was in South Africa at the same time as Smith and, indeed, assumed from him responsibility of the collections in the South African Museum in Cape Town.

Although Smith described *C. natalensis* from two specimens, a male and female, there are four listed in published type catalogues (Stone 1899, Warren 1966, van den Hoek Ostende *et al.* 1997). Of the two 'types' deposited in The Natural History Museum, BMNH 1848.3.31.1 was collected and presented by Smith and therefore appears to be the male syntype. The second specimen, BMNH 1846.10.24.6 is of less certain provenance and it remains unknown as to how the London dealer Argent came by this specimen or why the museum considered it a type. It is unsexed but appears to be a female. If this specimen is not the female syntype, then perhaps the validity of ANSP 21.884 in The Academy of Natural Sciences, Philadelphia, is supported. The specimen deposited in the National Museum of Natural History, Leiden, RMNH 88383, is clearly not the holotype and no reason is given as to why it is considered a type. This specimen came from the Swedish collector J. A. Wahlberg who visited Natal in 1839 (Clancey 1964), and the inclusion of this specimen in a type catalogue is therefore erroneous. A final point of interest may concern a mounted specimen held in the collection of the Muséum National d'Histoire Naturelle, Paris, received from J. Verreaux, possibly in 1837. It is a female with an old catalogue number, 5261, that was collected at Port Natal (Cap. B. Esperance), but it is not marked as a type and it is impossible to confirm its origin.

Smith based his description of *C. rufigena* on six males collected in South Africa, although precise localities were not given. As mentioned above, the male specimen BMNH 1848.3.13.3, collected by Smith and presented by him to The Natural History Museum, would appear to one of the types. There is a second specimen in the museum that was collected and presented by Smith, but which was not recognised as a type by either Hartert (1892) or Warren (1966). This specimen is BMNH 1863.3.10.11, an adult male collected at the Cape of Good Hope. One of the labels attached to this specimen is cardboard, elongated and octagonal, and is similar to a label attached to the type of *C. lentiginosus* (see below). On one side, it has the number 1, *Caprimulgus*, male, and is hand-coloured blue at one end. It seems likely that this specimen is also one of Smith's six types. Examination of the four 'types' in The Academy of Natural Sciences, Philadelphia, reveals that original labels are no longer attached to the specimens and only two males, ANSP 21830 and ANSP 21835, are noted as originating from Verreaux and have his number 2810. The status of the remaining two 'types' is questionable. ANSP 21834 is an immature male and ANSP 21831 is labelled as a female, but may be an immature male, and both therefore differ from the description given by Smith. Two other specimens, ANSP 21832 and ANSP 21897, arrived with the Rivoli (Massena) collection, but neither are types.

Smith described *C. lentiginosus* from two females collected in Great Namaqualand. As mentioned above, the female specimen BMNH 1848.3.31.2, collected by Smith and presented by him to The Natural History Museum, would appear to one of the types. In addition to two modern British museum labels attached to this specimen, there is an elongated, octagonal, cardboard label, which is similar to that attached to the specimen of *C. rufigena* BMNH 1863.3.10.11 (see above). The second 'type', ANSP 21.839, is more problematic. It was originally in the Rivoli (Massena) collection and was marked by Verreaux as 'Type de Smith', but it is labelled as having been collected at the Cape of Good Hope rather than Great Namaqualand.

I have been unable to locate any other 'Smith' nightjar specimens and suggest that a more accurate treatment of his nightjar types could be listed below (see appendix). It may also be of interest to confirm that I have not found any of Smith's specimens of *Caprimulgus europaeus* or *C. pectoralis* (Smith 1837, 1845, Kirby 1939, 1940).

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APPENDIX

Accepted types				
BMNH1848.3.31.1	*Caprimulgus natalensis*	male	Port Natal 1832	leg. Smith
BMNH1948.3.31.2	*Caprimulgus lentiginosus*	female	Great Namaqualand 1828	leg Smith
BMNH1848.3.13.3	*Caprimulgus rufigena*	male	Cape of Good Hope	leg. Smith
BMNH1863.3.10.11	*Caprimulgus rufigena*	male	Cape of Good Hope	leg. Smith
Doubtful types				
BMNH1846.10.24.6	*Caprimulgus natalensis*	female	Port Natal	Argent
ANSP21.884	*Caprimulgus natalensis*	female	Port Natal	Verreaux 2826
ANSP21.830	*Caprimulgus rufigena*	male	Cape of Good Hope	Verreaux 2810
ANSP21.835	*Caprimulgus rufigena*	male	Cape of Good Hope	Verreaux 2810
ANSP21.839	*Caprimulgus lentiginosus*	female	Cape of Good Hope	Verreaux
Rejected types				
RMNH88383	*Caprimulgus natalensis*	male	Port Natal	leg. Wahlberg
ANSP21.831	*Caprimulgus rufigena*	female?	Cape of Good Hope	Verreaux
ANSP21.834	*Caprimulgus rufigena*	imm. male	Cape of Good Hope	Verreaux

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The voice and bill length of Karamoja Apalis *Apalis karamojae* are atypical of the genus

by Philip Shaw, Elias Mungaya, Njano Mbilinyi & Maneno Mbilinyi

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Karamoja Apalis *Apalis karamojae* is a globally threatened (Vulnerable), restricted-range warbler (BirdLife International 2000, Stattersfield *et al.* 1998), discovered in Karamoja District, Uganda, in 1919, and in Tabora Region, Tanzania, in 1961 (Collar & Stuart 1985). The latter population has been recognised subspecifically, as *A. k. stronachi* (Stuart & Collar 1985).

In Tanzania, the species' main stronghold is thought to lie in the Wembere Steppe, an area of seasonally inundated grassland on the border between Tabora and Singida regions (Collar & Stuart 1985). Since the early 1990s the species has also been recorded in Serengeti National Park and adjoining protected areas, over 100 km further north. In 1993, D. Moyer encountered several groups in the Serengeti, and has suggested that its behaviour and voice more closely resemble those of a prinia than an apalis (D. Moyer *in litt*. 2004). The taxonomy of *A. karamojae* has received scant attention, however, and most aspects of its behaviour and ecology, including its voice and diet, are undescribed (Urban *et al*. 1997). A single nest with eggs has recently been found, but has yet to be formally described (N. E. & L. M. Baker *in litt*. 2004). Here, we present the first description of the species' voice, and compare its biometrics with those of other apalises. We demonstrate that its song and bill length differ markedly from those of its congeners, and suggest that its inclusion in *Apalis* merits further investigation.

Methods

As part of a study of the status and habitat of Karamoja Apalis in Wembere Steppe, 18 individuals were ringed at four sites in July 2003: near Igunga (33°54'E, 04°18'S and 33°46'E, 04°18'S), Itumba (33°53'E, 04°34'S) and Mwalala (33°56'E, 04°24'S) (Shaw *et al*. 2004). Wing (flattened chord), tarsus (intertarsal joint to the last complete scale before the toes diverge), tail (base to the longest rectrice) and bill length (bill tip to the base of the skull) of 17 individuals were recorded. Weights were taken using a 50-g Pesola balance, accurate to 0.5 g. Eight individuals were tentatively sexed as male and four as female, based on the amount of grey on the breast (Stuart & Collar 1985). Wing and tail lengths of Karamoja Apalis were compared with those of males of 20 other apalis species, taken from Urban *et al*. (1997). As tail length within the genus appears to be proportionately longer in forest canopy-dwelling species, all other apalis species were first classified according to the vegetation strata with which they are mainly associated, based on Urban *et al*. (1997), comments from F. Dowsett-Lemaire (*in litt*. 2004) and personal observations. Each was assigned to one of the following categories: forest-canopy species (*A. jacksoni*, *chariessa*, *nigriceps*, *chirindensis*, *porphyrolaema*, *chapini*, *sharpii*, *rufogularis*, *cinerea*, *alticola*); those occurring mainly in mid or lower strata (*A. thoracica*, *pulchra*, *ruwenzorii*, *binotata*, *personata*); and those occurring in a wide range of strata (*A. ruddi*, *flavida*, *melanocephala*, *bamendae*, *goslingi*).

Voice descriptions presented below are based on encounters with at least 73 adult Karamoja Apalis and 39 recorded song sequences, involving eight pairs. As the majority of recorded sequences were prompted by playback, this small, non-independent sample may not be representative of the study population as a whole, but provides an indication of the character and variability of the species' song. The recorded sample did not appear to differ qualitatively from spontaneous song sequences heard in the field. Recordings were made using a Sony Professional Walkman cassette tape-recorder, with Sennheiser ME66 directional microphone. Sonograms were produced using Avisoft-SASLab Pro Version 3.95c.

Results

Voice

Song.—Karamoja Apalises typically sang from near the top of *Acacia drepanolobium* trees, at a height of *c*.2–3 m. Pair members perched prominently, usually less than 1 m apart, and were sometimes accompanied by 1–2 juveniles. Song consisted of a series of musical, fluid phrases, each comprising 2–5 (commonly four) notes. Singing pairs were audible over distances of up to *c*.200 m.

The song is a rapid, well-synchronised, antiphonal duet (Fig. 1), each member of the pair producing alternate notes. This was confirmed on several occasions when members of a singing pair were widely separated or when individuals sang alone leaving 'gaps' normally filled by their partner (Fig. 1b). One lone bird sang at a rate of 1.3 notes second^{-1}, compared with a rate of 2.7–3.2 notes per second^{-1} for duetting pairs (n=5 spectrograms). Duets were occasionally preceded by 3–4 *tui* notes given by one bird, which may have helped synchronise the pair. In two cases, where colour-ringed pairs were closely observed, the song was initiated by the male (see above).

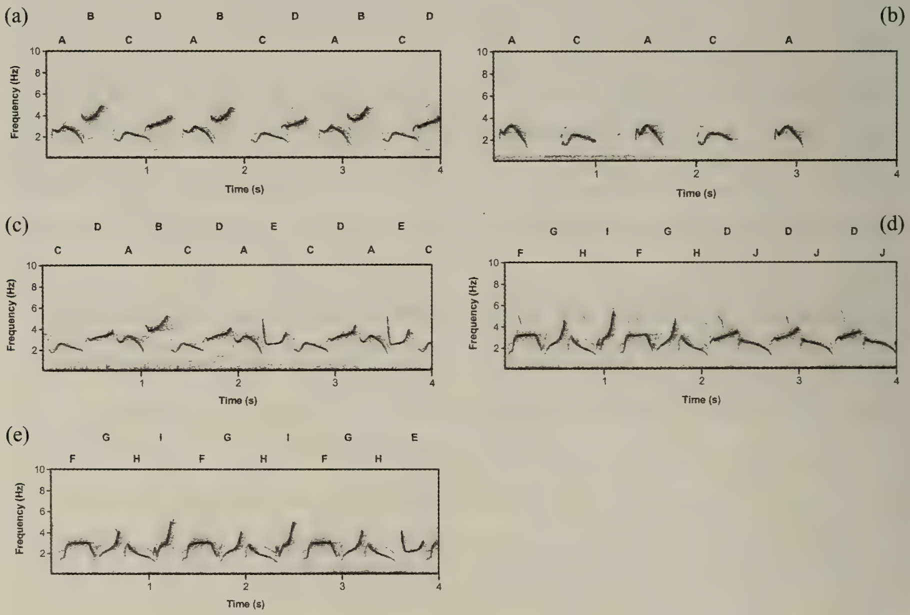

Figure 1. Sonograms of Karamoja Apalis *Apalis karamojae* song types. Each note has been given an arbitrary letter identifier. a) A typical duet, showing the contribution made by each pair member. Notes 'A' and 'C' are thought to have been produced by the male. b) Song produced by one individual, in the temporary absence of its partner. c) Duet in which the note 'B' is substituted with 'E'. d) A duet similar in structure to 'a' (four-note phrases), but consisting of different notes. e) The same song type as in 'd', but tailing off with a repetition of two notes.

Sonograms produced from 11 song sequences contained a combined repertoire of 12–13 mainly piping or whistling notes, some with a downward slur. Phrases were usually repeated several times and varied markedly (Fig. 1). Examples included: *dway tow tee tow tee*, *wee way toi tuu*, *wee wee tee way*, *wee way wee tuu*, *toi way wee tuu*. Recorded songs lasted 6–71 seconds (median: 32 seconds, *n*=39), each sequence consisting of up to five phrases (median: 3). In most cases, a phrase was repeated for *c.*10–20 seconds before being replaced or alternated with another. The number of different phrases given showed an approximately linear increase with the length of the song sequence (Fig. 2), such that songs lasting longer than 30 seconds contained a mean 3.5 different phrases, compared with a mean 2.4 phrases in shorter sequences. Usually, 1–2 phrases predominated. Sonograms of two songs contained seven different phrases, two of which accounted for 84% of the song.

Contact/alarm calls.—Individuals occasionally gave an intense, rasping *jirrrrr jirrrrrr* (Fig. 3a) while being handled. At other times a soft, rapid *we we we we…* or *dwe dwe dwe dwe* …(5–6 notes second^{-1}) was given when foraging birds were approached closely, or immediately after their release (Fig. 3b). The same note, given 2–3 times, appeared to be used as a contact call between foraging pair members.

Begging call.—Several groups contained fledged offspring which begged persistently, giving a rapid '*chit-chit-chit* ... *chit-chit-chit-chit*' (3–4 notes second^{-1}) (Fig. 3c). This was replaced with a brief, rasping call when adults approached with food.

Biometrics

The wing, tail and tarsus measurements of 17 Karamoja Apalises examined in this study were similar to those of four *A. k. stronachi* specimens studied by Stuart & Collar (1985) (Table 1), who noted that whilst measurements of *stronachi* exceeded

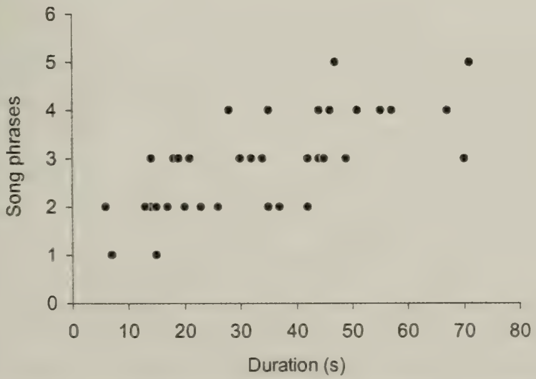

Figure 2. The relationship between song duration and the number of different types of song phrase used (*n*=39 recorded song sequences).

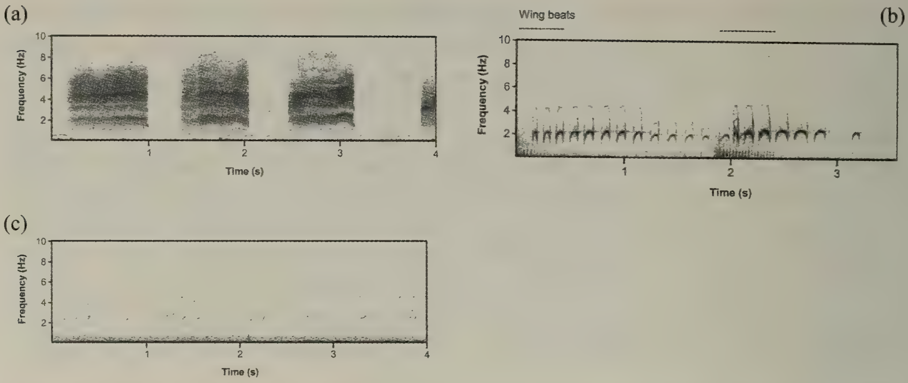

Figure 3. Sonograms of: a) intense alarm call by adult while being handled; b) contact or alarm call, here given by two birds released in succession; c) begging notes of two juveniles.

those of the nominate, differences between the two races were not statistically significant, perhaps due to the small sample size available. When measurements of *A. k. stronachi* from the two studies were pooled, the Tanzanian race (*n*=21 individuals) was indeed found to be significantly larger than the nominate race (*n*=3: Stuart & Collar 1985), in terms of wing length (Mann-Whitney $U_{3,21} = 2.00$, $p=0.007$) and tail length (Mann-Whitney $U_{2,21} = 3.00$, $p=0.042$), but not tarsus length (Table 1).

Whilst tail lengths of canopy-dwelling *Apalis* species were, on average, 10% longer than their wing lengths (mean ratio of tail : wing length = 1.10:1; *n*=10 species), the converse was true of species associated with lower vegetation layers (mean ratio = 0.90:1, *n*=5) (Mann-Whitney $U_{5,10} = 45.00$, $p=0.014$). Those

TABLE 1

Biometrics of Karamoja Apalis *Apalis karamojae*; mean (range, *n*).

Race	Wing (mm)	Tail (mm)	Tarsus (mm)	Bill (mm)	Weight (g)	Sources
A. k. karamojae	49.7 (49–50, 3)	45.0 (43–47, 2)	17.8 (17.0–19.1, 3)	16.4 (15.8–16.8, 3)	9.0 (1)	Stuart & Collar (1985)
A. k. stronachi	53.3 (52–55, 4)	48.3 (47–50, 4)	18.5 (17.8–19.1, 4)	16.2 (15.3–16.7, 4)	-	Stuart & Collar (1985)
A. k. stronachi	52.4 (50–54, 17)	49.7 (46–52, 17)	18.2 (17.2–19.5, 17)	16.3 (15.4–17.3, 17)	9.2 (8.0–10.5, 16)	this study
A. k. stronachi (pooled data)	52.5 (50–55, 21)	49.4 (46–52, 21)	18.2 (17.2–19.5, 21)	16.3 (15.3–17.3, 21)	9.2 (8.0–10.5, 16)	Stuart & Collar (1985), this study
Both races combined	52.2 (49–55, 24)	49.0 (43–52, 23)	18.2 (17.0–19.5, 24)	16.3 (15.3–17.3, 24)	9.2 (8.0–10.5, 17)	Stuart & Collar (1985), this study

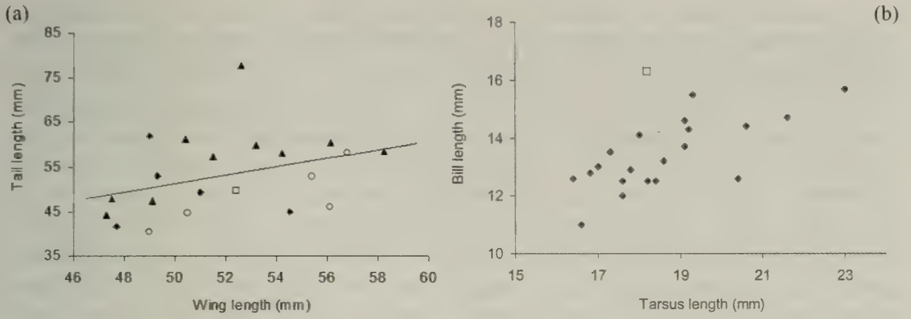

Figure 4. Biometrics of (unsexed) Karamoja Apalis *Apalis karamojae* (□) in comparison with those of its congeners. Other symbols each represent the mean value for males of one species. a) Mean tail length in relation to wing length. ▲: canopy-dwelling species; ◆: species occurring within a range of strata; ○: mid or lower strata species. A linear regression model has been fitted in which Y = 0.956(X) + 3.410. b) Mean bill length in relation to tarsus length.◆: species other than Karamoja Apalis.

associated with a wide range of strata had wings and tails of equal length, on average (mean ratio = 1.00:1, *n*=5). These findings reflect differences in tail lengths (but not wing lengths) of canopy-dwelling and lower strata species (Mann-Whitney $U_{5.10}$ = 41.00, p=0.050). The ratio of tail : wing length in Karamoja Apalis was 0.95:1 (*n*=17 birds), and thus close to that of apalises associated with mid or lower vegetation layers, most of which fell below a regression line relating tail to wing length within the genus as a whole (Fig. 4a).

Mean bill length of Karamoja Apalis (16.3 mm, *n*=17; Table 1) exceeded that of other apalis species (means of 11.0–15.5 mm; *n*=20 species: Urban *et al.* 1997), particularly in relation to tarsus length, the ratio of bill : tarsus length being 0.90 in Karamoja Apalis and 0.62–0.80 in other species (Fig. 4b).

Discussion

Karamoja Apalis produces a distinctive, complex antiphonal duet. In contrast, most apalises produce simple, repetitive songs, in which the same note is repeated persistently, usually at *c*.2–6 notes second^{-1}. Although almost all apalises duet, the sexes typically produce very different-sounding notes. Male Yellow-breasted Apalis *A. flavida flavocincta*, for example, give a 'rolling clicking call', sometimes accompanied by a crescendo of squeaks from the female (Lewis 1982). Similarly, male Chapin's Apalis *A. chapini strausae* produce a monotonous *tje-tje tje-tje*, whilst the female's contribution, which is not always given, is a weak *pee-pee* (Dowsett & Dowsett-Lemaire 1980, Dowsett-Lemaire 1986). In some species, the female is much less strident or less persistent than the male, e.g. Rwenzori Apalis *A.* (*pulchra*) *ruwenzorii* and Kungwe Apalis *A. rufogularis argentea* (Dowsett-Lemaire 1990, Dowsett-Lemaire & Dowsett 1990).

In contrast, male and female Black-throated Apalis *A. jacksoni* give similar or identical notes, which, in most populations, are delivered at differing rates, so that partners alternately fall into and out of synchrony (Dowsett-Lemaire 1990, Urban *et al.* 1997). Pairs of White-winged Apalis *A. chariessa* also produce very similar-sounding notes, delivered as a well-synchronised, antiphonal duet. Of all the other apalises, the song of White-winged perhaps most closely resembles that of Karamoja, but is much simpler, consisting of the same two notes repeated: *tee-lu dee-lu tee-lu dee-lu* (Dowsett-Lemaire 1989). Karamoja Apalis would therefore appear to be the only species in its genus to produce a complex antiphonal duet, consisting of repeated but varied song phrases, typically containing 4–5 different notes. Furthermore, the delivery, by pairs or groups perched conspicuously on bush- or treetop, seems more typical of some prinias (D. Moyer *in litt.*), particularly White-chinned Prinia *Schistolais leucopogon* (pers. obs.).

Whilst the ratio of tail : wing length in Karamoja Apalis is close to that of *Apalis* species associated with mid or lower vegetation layers, its bill is markedly longer than that of its congeners, particularly in relation to tarsus size. This may represent an adaptation for foraging amongst the long spines and pseudo-galls characteristic of *Acacia drepanolobium*, with which the apalis is almost exclusively associated in the Wembere Steppe (Shaw *et al.* 2004). The species also differs from its congeners in terms of habitat. Of the 20 other apalis species recognised by Urban *et al.* (1997), most occur largely or exclusively in rainforest. Only two, Bar-throated Apalis *A. thoracica* and Yellow-breasted Apalis, are widespread in non-forest as well as forest habitats, occupying woodland, thicket and scrub (Urban *et al.* 1997). Karamoja Apalis is unique within the genus in being apparently confined to semi-arid scrub (Urban *et al.* 1997, Shaw *et al.* 2004).

Given that the species differs markedly from its congeners in voice, bill length and habitat, its inclusion within *Apalis* appears worthy of re-analysis. At least four warbler species once placed in the genus have been re-assigned to different genera, as their ecology and behaviour have become better known (Black-headed Rufous Warbler *Bathmocercus cerviniventris*, Red-fronted Warbler *Urohipis rufifrons*, Moreau's Tailorbird *Artisornis moreaui* and White-tailed Warbler *Poliolais lopesi*: Urban *et al.* 1997). A comparison between the nest structure and DNA of Karamoja Apalis, and those of its congeners and members of similar genera (e.g. *Prinia* and *Schistolais*), may resolve the species' taxonomic position.

Acknowledgements

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Observations on the breeding of *Basileuterus* warblers in Ecuador

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The genus *Basileuterus* contains 24 species ranging from Mexico and the southwest USA to Bolivia, and reaches its greatest diversity in northern South America (Curson *et al*. 1994). There are eight species in Ecuador (Ridgely & Greenfield 2001), four of which are sympatric in the part of eastern Ecuador studied here. Little or nothing is known of the breeding habits of most of the genus, but described nests all appear to be on or near the ground and are domed cups with a side entrance. Here

TABLE 1
Dry weight (grams) nest component data for *Basileuterus* warblers.

		trifasciatus	*coronatus*	*tristriatus*
1° lining	Soft orange tree fern fibres	0.0	0.0	1.69
	Pale grass and plant fibres	0.29	6.73	0.0
	Soft pale tree fern chips	6.21	0.0	0.0
	Black rootlets	0.58	0.0	0.0
2° lining	Coarse orange tree fern fibres	0.0	0.0	2.16
	Moss	0.43	0.0	0.0
	Pale grass and plant fibres	0.0	2.74	0.0
	Black rootlets	0.0	0.10	0.0
3° lining	Pale grass and plant fibres	—	—	6.96
Dome and body of nest	Moss	3.69	7.40	6.87
	Sticks and leaf petioles	1.29	2.14	0.78
	Leaves	0.32	19.90	12.51
	Black rootlets	1.99	0.84	4.03
	Dark tree fern chips	0.0	0.04	0.0
	Extra fine dirt and material	2.55	0.0	0.0
Totals		17.35	39.35	35.00

we summarise current knowledge on the breeding of, and present additional observations for, four of the eight species found in Ecuador.

Observations on *Basileuterus nigrocristatus*, *B. coronatus* and *B. tristriatus* were made around Yanayacu Biological Station (00°35'S, 77°53'W) in Napo province, eastern Ecuador at elevations ranging from 1,950 to 2,250 m. Cloud forest in the area is interspersed with cattle pastures and naturally occurring *Chusquea* bamboo, but large tracts of intact forest remain.

Observations on *B. trifasciata* were made around the small town of Celica in southern Ecuador's Loja province. Most forest in this area has been cleared but small tracts of disturbed forest remain as patches within cattle pasture. For a more complete site description see Dobbs *et al.* (2001). Transcriptions and videos of this species are deposited in the Yanayacu Video and Sound Library.

Nests were measured to the nearest 0.5 cm in most cases and to the nearest 0.1 cm for *B. trifasciata*. To ascertain the relative proportions of various materials used in nest construction, nests were air dried for over three months. Following this they were separated into their various components and weighed.

Species accounts

THREE-BANDED WARBLER *Basileuterus trifasciata nitidior*

This warbler is endemic to the Tumbesian region of north-west Peru and south-west Ecuador (Fjeldså & Krabbe 1990, Curson *et al.* 1994), and in Ecuador is most common in our study area near Celica (Ridgely & Greenfield 2001). Following recent authors (e.g. Curson *et al.* 1994, Ridgley & Greenfield 2001), Three-banded Warbler is considered to be represented by two subspecies, with *nitidior* in Ecuador. Whilst Best (1992) reported singing birds and an active nest during the rainy season (January–March) in south-west Ecuador, the nest has never been formally described and nothing is known of the species' breeding biology.

The first nest was encountered on 13 February 2000 when an adult was flushed from it and found to be incubating two eggs. On flushing, the bird performed a distraction display by hopping on the ground with its wings held above its head. After moving several metres in this fashion, it joined its mate, and both adults scolded the observer from nearby underbrush. The two eggs were creamy pinkish white with maroon-brown speckling heaviest at the larger end, and measured 17.68 mm by 13.39 mm and 17.70 mm by 13.95 mm respectively. On 23 February the nest was found empty but seemingly intact.

On 2 March 2000 a second nest was found with a single egg identical to those described above. On 3 March the nest was observed while the female laid the second egg at 06.25 h. The female approached the nest chipping loudly while the male sang *c.*3 m away. Incubation of the first egg had apparently not commenced, as it was cold at the time of laying the second egg. No further observations were made at this nest.

On 29 March 2001 a third nest was found containing two nestlings. On 31 March the nest was filmed from 07.00 h to 14.00 h. These videos were later transcribed and we summarise the information here. The young had yellow gapes with red mouth linings and begged horizontally from the nest opening. They often anticipated the arrival of an adult by 1–2 seconds, particularly in late morning, and begged irregularly in the absence of adults. In begging, nestlings emitted a thin, high-pitched call. Adults did not enter the nest to feed the young, but perched just below the entrance. They were always seen foraging together, and commonly fed together in rapid succession. Thirty-seven percent of feedings were followed within one minute by a feeding by the second adult. When feeding in succession adults commonly fed different nestlings despite the fact that nestlings would rapidly swallow prey and resume begging. Adults spent only brief periods at the nest and no rapid probing of the nest lining was seen as in other species at this site (e.g. *Grallaria guatamalensis*: Dobbs *et al.* 2003).

During the seven hours of video observation, nestlings were fed 105 times (range 8–20 feeds/h; mean 15 feeds/h). Adults most frequently arrived carrying a single arthropod, the size of the bill or smaller. They fed only one nestling on 56 of 66 feeds where this behaviour was visible. Less frequently they arrived carrying several prey items, which appeared to coincide with disturbances around the nest during which adults continued to forage. While most food items could be identified no more specifically than arthropods, twice adults were seen to feed a single katydid (Orthoptera, Tettigoniidae), once a walking stick (*Phasmida*), and once each a lepidopteran larvae and an adult. If a nestling had difficulty in swallowing an item, adults would remove the prey and manipulate it before returning it to the same nestling.

In seven hours, the adults removed eight faecal sacs. Before producing a faecal sac, nestlings turned 180° and held their cloacas to the edge of the nest, where adults took the faecal sac directly from the nestling. Occasionally the faecal sac would fall, and the adult would retrieve it as it rolled down the front of the nest.

Of the three observed nests, two were on the ground nestled in low dirt banks within disturbed habitats. The third, that videotaped, was beside a small boulder roughly 2 m by 4.5 m by 1.5 m tall. This nest was *c*.65 cm above ground and constructed into the moss and ferns growing on the boulder. All nests were bulky domed cups. The first two had no perceivable lip in front of the cup, whereas the third had a 10 cm-wide lip extending 12.5 cm in front of the opening. The dimensions of two nests were recorded. Respectively, the entire domed structures measured 12.5 cm and 11.2 cm tall, by 14.5 cm and 15.6 cm wide by 11.0 cm and 13.0 cm deep. The openings measured 3.3 cm and 3.2 cm deep, by 3.2 cm and 3.2 cm tall by 5.6 cm and 6.4 cm wide. The chambers inside measured 8.0 cm and 7.5 cm tall. The cup of one measured 5 cm by 5 cm and *c*.4 cm deep. That of the second measured 5.8 cm by 6.2 cm and was 3.8 cm deep. In both nests the dome was of small twigs, rootlets and moss woven together. The cup of one was lined solely with very fine, pale dead grasses and the cup of the second was lined with these dead grasses plus soft, pale tree fern chips and a few black rootlets. Closer inspection of the second nest revealed a secondary lining of pure moss, but it was not well differentiated from the components of the dome. This second nest, that beside the small boulder, was collected after the young has fledged, and its components dried and weighed. The entire nest weighed 17.35 g and the various component weights are given in Table 1.

Additional observations for this species include adults with dependent fledglings on 28 April 2000 and on 3 May 2001.

BLACK-CRESTED WARBLER *Basileuterus nigrocristatus*

This species is closely related to Citrine Warbler *B. luteoviridis* and Pale-legged Warbler *B. signatus*, but the taxonomic status of this group is unresolved (Curson *et al.* 1994). Despite being distributed at 1,300–3,400 m, on both slopes of the Andes, from northern Venezuela to central Peru (Hilty & Brown 1986), there is surprisingly little morphological variation throughout Black-crested Warbler's range, and no subspecies or races have been described. Most published breeding data are from Colombia: Sclater & Salvin (1879) provided a brief description of the nest and egg; Hilty & Brown (1986) recorded birds in breeding condition in May–July and three feathered nestlings in October; juveniles were reported in March, June, July, October and January (Olivares 1969, Hilty & Brown 1986). Additionally, in Ecuador, juveniles have been reported in February and May (Fjeldså & Krabbe 1990, Curson *et al.* 1994) and breeding-condition birds and a nest with eggs in October (Guerrero 1996). Guerrero (1996) described the nest as spherical with a side entrance, suspended in vegetation 80 cm above ground, and constructed of thick plant fibres.

Our first nest found was found in mid-November 1996. It was spherical, *c.*15 cm in diameter, with a side entrance and constructed predominantly of dried grasses. It was located beside the trail in the Cordillera de Guacamayos, 5 km south-east of Yanayacu Biological Station, at 2,250 m. Supported by living plants, it was *c.*50 cm above ground. The nest contained a single egg with red-brown spotting. Approximately one month earlier the same nest contained two nestlings (J. Nilsson pers. comm.). It appears, therefore, that the same pair was attempting a second brood. No further data were obtained from this nest.

Subsequently, on 20 May 2001, a second nest was encountered adjacent to a trail on the privately owned preserve of Cabañas San Isidro at 2,200 m. It was suspended within *Chusquea* sp. bamboo (Poaceae), *c.*1 m above ground. At 11.15 h on 20 May an adult was flushed from the nest and two white eggs with heavy dark red spotting were discovered. The markings were heaviest at the larger end and formed a distinct ring. They measured 20.8 mm by 14.3 mm and 20.5 mm by 14.3 mm respectively. The nest appeared to be constructed entirely of interwoven, dead bamboo leaves and was domed, with a side entrance facing the trail (roughly north-east). The cup measured 5 cm in diameter by 3 cm deep. Outside, the nest measured 15 cm tall by 15 cm wide with a 5–10-cm lip of bamboo leaves leading to the entrance. The nest was visited again on 2 June and was found torn apart. While we could not collect the nest, our initial observations appeared correct in that the nest was almost entirely of bamboo leaves with perhaps a few black rootlets for structural support.

RUSSET-CROWNED WARBLER *Basileuterus coronatus*

Eight subspecies of this species are currently recognised, grouped into white-bellied and yellow-bellied forms (Curson *et al.* 1994). *B. c. orientalis* is an intermediate form and is found in our study area (Ridgely & Greenfield 2001). Curson *et al.* (1994) described the nest as 'on a bank on the ground and…probably domed' but no published description appears to be available. Breeding-condition birds have been reported in February–October in Colombia, and dependent young or juveniles in Colombia in May–October and in Peru in February–August (Hilty & Brown 1986).

A nest of the species was found on 21 September 2001, near a stream adjacent to the Yanayacu Biological Station, 5 km west of Cosanga, at 2,150 m. At 08.15 h on the date of discovery, an adult was flushed from the nest and found to have been incubating two eggs, which were pale pinkish buff with red-brown speckling concentrated at the larger end. They measured 21.3 mm by 15.0 mm and 21.4 mm by 15.2 mm respectively. On 30 September the nest was found empty but intact.

The nest was 8 m from a small stream in partially disturbed forest with an intact canopy dominated by *Vismia* sp. (Clusiaceae), *Bunchosia* sp. (Malphigiaceae), *Nectandra* spp. (Lauraceae) and *Solanum* sp. (Solanaceae). The understorey was fairly dense and dominated by *Chusquea* sp. (Poaceae) and various Piperaceae, Solanaceae, Gesneriaceae and Urticaceae. The nest was a moss, stick and leaf ball bound with fine black rootlets and nestled 5 cm above ground into the base of a tree root mass. This root mass formed a bank rising *c.*50 cm to the main trunk. The ball measured 14.5 cm wide by 20 cm tall with a 7-cm lip of leaves (predominantly *Chusquea* sp.), twigs and moss, extending out from a small side entrance, 7 cm wide by 4.5 cm tall, and opened into a chamber measuring 6 cm wide by 7.5 cm tall. The cup was lined with pale grass, pale plant fibres and *c.*40 pale tree fern scales. It measured 5 cm wide by 4 cm deep. On closer inspection, the cup was noted as being formed of two distinct layers: the first (described above) was held within a thinner cup of pale fibres interlaced with black rootlets. The entire dry weight of the nest was 39.35 g and nest composition is given in Table 1.

THREE-STRIPED WARBLER *Basileuterus tristriatus*

This warbler occurs from Costa Rica to central Bolivia and was considered to comprise 13 subspecies by Curson *et al.* (1994). Three subspecies occur in Ecuador and that in our region, *baezae*, is restricted to eastern Ecuador (Ridgely & Greenfield 2001). Nests are reportedly on the ground but have not been well described (Curson *et al.* 1994). From Colombia, Hilty & Brown (1986) reported nests with eggs in April–June, fledglings or juveniles in January–July and September–November, and breeding-condition adults in May–July.

The only nest of this species was located at the edge of a cattle pasture along the Baeza–Cosanga road at 1,950 m. It was on the ground against a 60-cm-high bank and nestled within ferns growing from the bank. The dome was constructed of moss, leaves and a few sticks bound together with a large number of fine black rootlets. The cup comprised three distinct layers: the inner was entirely soft orange-brown tree fern fibres, the middle was constructed of coarse fibres similar to those of the primary lining, and the outer was of pale fibres and a few pieces of skeletonised leaves. The entire dry weight of the nest was 35 g and the various component weights are given in Table 1. The nest was found during construction on 12 May 2001, was noted to contain two white eggs with dark reddish splotching on 27 May 2001, and was found empty and collected in late June.

Each of the four species studied here belongs to a different 'group' of warblers within the genus *Basileuterus*, following Curson *et al.* (1994). The details of nest architecture and nest component data presented here follow the established trend for *Basileuterus* to construct bulky domed nests (Curson *et al.* 1994). It is interesting to note, however, that between these species, detailed architecture ranges considerably. From the relatively simple nest, constructed of mostly or entirely a single material and with no apparent differentiated lining, constructed by Black-crested Warbler, we see a trend of increasing complexity to the nest of Three-striped Warbler which had three distinct cup linings and at least seven types of materials.

Further natural history observations and detailed taxonomic work are needed to further explore these findings.

As mentioned by Curson *et al.* (1994), habitat conservation is a priority for overall preservation of most species. The detailed nest component data presented here reveal that, whilst like many *Basileuterus*, these species breed in relatively disturbed habitat, all except Black-crested Warbler included materials gathered from plant species occurring within mature cloud forest (eg. tree fern scales). This observation points to a need for further detailed natural history studies of these and other taxa to fully elucidate species' habitat requirements, which may be critical for development of appropriate conservation tactics.

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A hummingbird species new to Peru: range extension for the Greenish Puffleg *Haplophaedia aureliae*

by A.-A. Weller

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Pufflegs of the genus *Haplophaedia* inhabit the foothills and main cordilleras of the northern and central Andes from extreme eastern Panama and northern central Colombia to north-west Bolivia (e.g. Wetmore 1968, Fjeldså & Krabbe 1990, Schuchmann 1999). Presently, three species are recognised, *H. aureliae*, *H. assimilis* and *H. lugens* (Schuchmann *et al.* 2000). The latter taxon is endemic to the western Andean slope from south-west Colombia and north-west Ecuador, and is characterised by a blackish-green plumage. *H. aureliae* occurs from eastern Panama (Darién highlands) to southern Ecuador, mainly along the east slope of Andes. From north-east Peru to western Bolivia, it is replaced by *H. assimilis*. These taxa can be discriminated by the reflectance of greenish plumage (duller in *assimilis*) and the coloration of the typically enlarged tibial tufts (mostly whitish in *aureliae*, buff to cinnamon in *assimilis*: Schuchmann *et al.* 2000).

A recent study of Andean hummingbirds in the collection of the Louisiana State University Museum of Zoology, Baton Rouge (LSUMZ), yielded two previously overlooked specimens of *H. aureliae* from the north-east Andes of Peru. Following the taxonomic concept applied by Schuchmann *et al.* (2000), they represent the first species records for Peru.

Material and methods

During biogeographic and taxonomic studies of *Haplophaedia*, a total 94 specimens of *H. aureliae* and 29 *H. assimilis* were examined for distribution and geographic variation in accordance to methods in Schuchmann *et al.* (2000). Where possible, four standard measurements were obtained using a digital calliper (accuracy 0.1 mm): bill length (from tip to nasal operculum), wing length (unflattened chord), and tail length (rectrices 1, 5). Coordinates and altitudes of localities, if not given on specimen labels, were determined through reference to ornithological gazetteers (Stephens & Traylor 1983, Paynter 1993, 1997) and additional literature (Fitzpatrick & O'Neill 1979).

Results and discussion

The known ranges of the six subspecies of Greenish Puffleg can be summarised as follows (from north to south, after Schuchmann *et al.* 2000; Fig. 1):

H. a. galindoi Wetmore, 1967: Cerros Malí and Tacarcuna, extreme east Panama (Darién) and extreme north-west Colombia (Chocó);

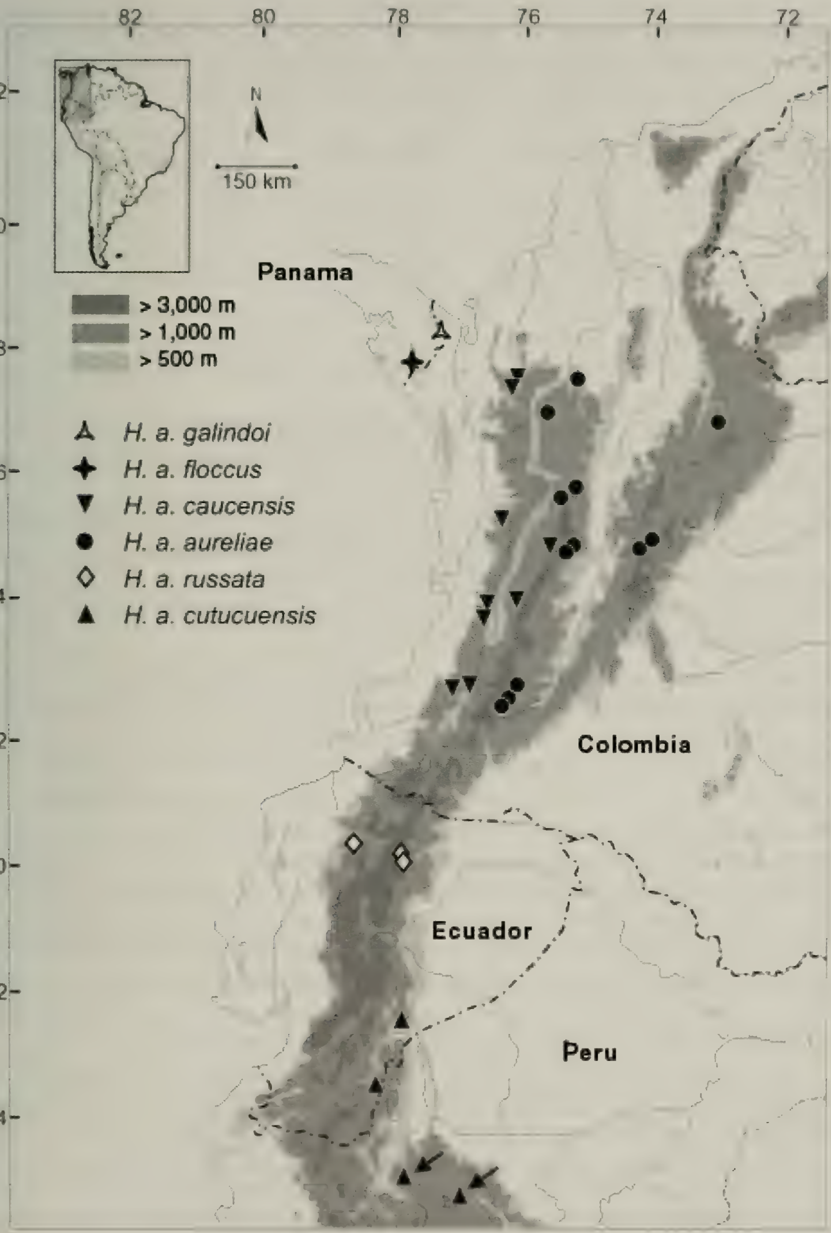
82
80
78
76
74
72
12
10
8
6
4
2
0
2
4
N
150 km
Panama
Colombia
Ecuador
Peru
> 3,000 m
> 1,000 m
> 500 m
H. a. galindoi
H. a. floccus
H. a. caucensis
H. a. aureliae
H. a. russata
H. a. cutucuensis

Figure 1. Distribution of subspecies of Greenish Puffleg *Haplophaedia aureliae*, based on examined specimens. Arrows indicate localities within Peruvian territory (LSUMZ 81858, 87525).

TABLE 1

Comparison of biometrics (mean ± s.d. [number of specimens], range) for measurements (mm) of both sexes of *Haplophaedia aureliae cutucuensis* (southern Ecuador) with LSUMZ specimens from north-east Peru (including data from Schuchmann *et al.* 2000).

Sex/specimen	Bill length	Wing length	Rectrix 1 length	Rectrix 5 length
Male	21.5±0.7 (8) 20.5–22.6	60.8±1.0 (6) 59.8–62.1	35.9±1.2 (8) 33.8–37.7	40.1±0.5 (7) 39.4–40.9
Female	20.9–22.0 (2)	54.6–54.9 (2)	33.0–34.5 (2)	33.2–34.9 (2)
LSUMZ 81858, M	19.8	60.6	35.6	37.0
LSUMZ 87525, F (?)	21.2	56.4	–	–

H. a. floccus Nelson, 1912: Cerro Pirre, east Panama (Darién);
H. a. caucensis Simon, 1911: Cordillera Occidental to western slope of the Cordillera Central, Colombia;
H. a. aureliae Bourcier & Mulsant, 1846: the northern and eastern Cordillera Central and western slope of the Cordillera Oriental, Colombia;
H. a. russata Gould, 1871: northern Andes of Ecuador;
H. a. cutucuensis Schuchmann, Weller & Heynen, 2000: Cordillera de Cutucú and Cordillera del Condor, southern Ecuador.

Until recently, specimens of this genus from Peru had usually been assigned to *H. aureliae*, as the forms *affinis* and *assimilis* were previously merged within this taxon (e.g. Simon 1921, Peters 1945, Zimmer 1951, Fjeldså & Krabbe 1990, Schuchmann 1999). Under the new taxonomy presented by Schuchmann *et al.* (2000), *H. assimilis* (including the subspecies *affinis*) was afforded species rank. Consequently, all Peruvian genus records refer to this taxon. Thus, it is unsurprising that the LSUMZ specimens had not been previously mentioned in the literature.

Both specimens (LSUMZ 81858, 87525) were obtained during LSUMZ bird surveys undertaken in the 1970s to the Andes of northern and north-east Peru (e.g. Fitzpatrick *et al.* 1977, O'Neill & Graves 1977, Fitzpatrick & O'Neill 1979). These expeditions produced not only valuable distributional and life history data for many poorly known Andean birds, but also yielded several new taxa to science, including the spectacular Royal Sunangel *Heliangelus regalis* (Fitzpatrick *et al.* 1979).

The first specimen of *H. aureliae* (81858) taken in Peru was collected by J. P. O'Neill on 26 June 1976 '10 km (by road) below (NE) Abra Patricia on road to Rioja', dpto. San Martín, at 6,200 ft (= *c.*2,000 m). Fitzpatrick & O'Neill (1979) gave the coordinates for Abra Patricia as 05°46'S, 77°42'W. More than two years later, on 13 August 1978, a second specimen (87525) was collected by T. S. Schulenberg along the 'trail 20 km E La Peca', dpto. Amazonas, at a similar altitude (6,250 ft) to the preceding locality. Further north than Abra Patricia, La Peca (= La Peca Nueva, trail at *c.*05°34'S/78°22'W; cf. Stephens & Traylor 1983) is located in the semi-isolated Cordillera de Colán east of the Utcubamba Valley. Habitat at both collecting sites is described as stunted cloud forest (Fitzpatrick & O'Neill 1979), which is preferred by members of *Haplophaedia* (Schuchmann 1999).

According to traditional species limits in *Haplophaedia*, both LSUMZ specimens are labelled as *H. aureliae* (one as *H. a. affinis*). This identification is supported by plumage characteristics, namely the strongly bronzish to copperish upperparts (e.g. tail-coverts), bronze-green underparts with conspicuous whitish fringes, and white leg puffs. The San Martín bird was sexed as a male, due to the cinnamon patch on the outer side of the tibial tufts and by morphometrics (Table 1). The second specimen, from dpto. Amazonas, was unsexed. Despite its plumage being partially damaged (tail, belly), it is probably a female, based on the entirely whitish leg puffs, broad subterminal throat bars, and bill and wing length (Table 1). The heavily scaled underparts of both specimens are typical of the southernmost subspecies, *cutucuensis*, but also of northern *floccus* (Schuchmann *et al.* 2000), indicating a kind of 'leapfrog pattern' (Remsen 1984). Although most mensural data fall within the range of *cutucuensis* (see Table 1), intraspecific variation was found to be generally low in *H. aureliae* (Schuchmann *et al.* 2000). Together, external characteristics suggest that these birds are *cutucuensis* rather than a morphologically distinctive and undescribed population of *H. aureliae*.

The LSUMZ records extend the currently known range of *H. aureliae* south-east by *c.*200 km across the arid central Marañón Valley, which is presumed to be a dispersal barrier for several Andean bird taxa, including hummingbirds such as metaltails *Metallura* (Heindl & Schuchmann 1998) and pufflegs *Eriocnemis* (Schuchmann *et al.* 2001). Abra Patricia is also close to the northernmost collecting site of *H. assimilis affinis*. The latter taxon occurs north at least to the Ray-Urmana range (06°28'S, 77°21'W: Schuchmann *et al.* 2000), with the distance between these localities being just *c.*70 km.

The range extension for *aureliae* reported herein is paralleled by new sight records in the north of the species' range (Serranía de Jungurudó, Panama: Angehr *et al.* 2004), suggesting that currently available, fairly scattered locality data for *Haplophaedia* (see Schuchmann *et al.* 2000) reflect insufficient sampling rather than real distributional patterns. Future ornithological work in thus far unexplored areas, including north-east Peru, may result in improved distributional information for the genus.

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Notes on some seabirds of Pernambuco state, north-east Brazil

by Caio José Carlos, Carmem Elisa Fedrizzi & Severino Mendes de Azevedo-Júnior

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Located in north-east Brazil, the state of Pernambuco (PE) has a coastline of 187 km (roughly between 07° and 09°S) dominated by sandy beaches fringed by the introduced coconut palm *Cocos nucifera*, with extensive mangroves of *Rhizophora mangle*, *Laguncularia racemosa* and *Avicennia* spp. only at river estuaries

(CONDEPE 1982, FIDEN 1987). The coastal climate is hot with a mean annual temperature of 25.5°C, and mean annual rainfall of 152.3 mm (INMET 2003).

The coast is important for various birds, mainly migrant shorebirds and terns that use the region as wintering and stopover areas (Azevedo-Júnior & Larrazábal 2002, Fedrizzi 2003). However, except for a few studies in the Fernando de Noronha archipelago (currently part of PE) (e.g. Nacinovic & Teixeira 1987) and in the north of the state (Azevedo-Júnior 1998), very little research has focused on the seabirds that occur in PE.

Here we review the distribution and present new data for some seabirds of PE, based on the literature, specimens in the ornithological collection of the Universidade Federal de Pernambuco (UFPE) and our own field work. For simplicity, we list geographical coordinates, some of them taken from Paynter & Traylor (1991), for each locality only on its first mention in the text. English names and taxonomic sequence follow del Hoyo *et al.* (1992, 1996), except for Atlantic Yellow-nosed Albatross *Thalassarche chlororhynchos*, where we follow Robertson & Nunn (1998). Biometrics (mm) of specimens are: exposed culmen (ec), total culmen (tc), wing length (wl), tarsus (tr), tail (ta) and total length (tl).

Species accounts

MAGELLANIC PENGUIN *Spheniscus magellanicus*
A common visitor to southern Brazil (Rio Grande do Sul) during the austral winter, which occasionally reaches north to Rio de Janeiro, with vagrants recorded north to Bahia (Sick 1997) and Alagoas (F. J. M. Pinto *in* Teixeira *et al.* 1988). The *Jornal do Comércio*, a local newspaper, noted an immature found alive at Itamaracá Island (*c.*07°45'S, 34°51'W) on 13 August 1999, which appears to be the northernmost record for this species in the Atlantic.

ATLANTIC YELLOW-NOSED ALBATROSS *Thalassarche chlororhynchos*
T. chlororhynchos is a globally threatened species (Endangered) which breeds on Gough and Tristan da Cunha (BirdLife International 2000), and is one of the commonest albatrosses off the Brazilian coast (Grantsau 1995). Coelho (1978) mentioned a record for PE, but did not provide the source, date or locality. It was based on a specimen (UFPE 799; juvenile; ec 117.75, tc 132.46, wl 495, tr 79.31, ta 170, tl 800) found alive at Maria Farinha beach (*c.*07°40'S, 34°50'W), municipality of Paulista, on 19 May 1978. Additionally, another juvenile found in PE (locality and date unknown) was sent to Recife Zoo, and is currently on display at the Natural History Museum of the Environmental Education Centre there.

ANTARCTIC PRION *Pachyptila desolata*
Although treated as a subspecies of Broad-billed Prion *Pachyptila vittata* (e.g. Harrison 1985), many recent authors (e.g. del Hoyo *et al.* 1992) consider it a species. Coelho (1978) reported its presence in PE, but did not mention a source, locality or date. The record was based on a specimen (UFPE 358; male; ec 26.92,

tc 34.50, wl 195, tr 30.94, ta 95, tl 285; collected by A. Cruz) found at Tamandaré beach (*c*.8°36'S, 35°07'W), municipality of Rio Formoso, on 25 July 1978. Further records from Guadalupe Environmental Protection Area (*c*.08°48'S, 35°07'W), in the municipalities of Tamandaré and Barreiros (Neves *et al.* 2000) were, in fact, based on the same UFPE specimen.

CORY'S SHEARWATER *Calonectris* (*diomedea*) *borealis*

This Palearctic migrant occurs off Brazil en route to and from wintering areas off southern South America (Vooren & Fernandes 1989, Sick 1997). Azevedo-Júnior (1991) reported two dead birds at Boa Viagem beach (*c*.08°07'S, 34°53'W), Recife, one of which (UFPE 3406; female; ec 45.35, tc 60.07, wl 370, tr 48.65, ta 141, tl 498; collected by S. M. de Azevedo-Júnior, 2 September 1990) is currently held in UFPE. In addition, UFPE obtained one (3404; female; ec 56.40, tc 68.33, wl 350, tr 54.10, tl 140; collected by S. M. de Azevedo-Júnior) from Tamandaré beach on 21 January 1991, and another (3405; male; ec 46.63, tc 61.85, wl 360, tr 54.29, ta 131, tl 470; collected by S. M. de Azevedo-Júnior) from Coroa do Avião (07°40'S, 34°50'W), municipality of Igarassu in July 1991.

MANX SHEARWATER *Puffinus puffinus*

Manx Shearwater occurs off the Brazilian coast en route to and from the wintering grounds off southern South America (Sick 1997). There is only one published record from PE, of one flying over the Coroa do Avião on 3 May 1992 (Azevedo-Júnior 1998). At the same locality, one (UFPE 3985; male; ec 34.2, wl 260, tr 42.2, ta 81; collected by S. M. Azevedo-Júnior) was mist-netted on 16 November 2003.

GREATER SHEARWATER *Puffinus gravis*

Coelho (1978) mentioned this shearwater for PE, without source, locality or date. The record was based on a specimen (UFPE 841; male; ec 44.19, tc 56.19, wl 312, tr 56.11, ta 110, tl 505; collected by A. G. M Coelho) found at Ponta de Pedras beach (*c*.07°41'S, 34°53'W), municipality of Goiana on 20 July 1978. Azevedo-Júnior (1991) reported 12 specimens found dead at Boa Viagem beach, of which two (3400; male; ec 45.94, tc 53.29, wl 315, tr 59.21, ta 120; and 3402; unsexed; ec 43.63, tc 50.16, wl 320, tr 54.24, ta 105; both collected by S. M. Azevedo-Júnior, in May 1990) are in UFPE. In addition, UFPE has one (949; unsexed; ec 49.11, tc 57.67, wl 350, tr 57.58, ta 100; collected by A. G. M Coelho) from Olinda (*c*.08°01'S, 34°51'W) in June 1980.

MASKED BOOBY *Sula dactylatra*

In Brazil, this booby breeds on offshore islands such as the Abrolhos, Fernando de Noronha and Atol das Rocas (Sick 1997). Azevedo-Júnior (1994) reported a specimen, originally banded (V-18954) on 17 December 1992 in the Biological Reserve of Atol das Rocas (*c*.03°45–03°56'S, 33°37'W), found alive at Gaibú beach (*c*.08°05'S, 34°51'W), municipality of Cabo de Santo Agostinho, on 12 August 1993. UFPE also obtained one (3684; juvenile; tc 96.43, wl 440, tr 44.14, ta 150, tl

750; collected by S. M. Azevedo-Júnior) from Boa Viagem beach on 16 April 2001. According to del Hoyo *et al.* (1992), young disperse extensively, but most adults are present year-round in the vicinity of colonies, presumably explaining the apparently accidental occurrence of juveniles in PE.

BROWN BOOBY *Sula leucogaster*

Previous PE records involved two observed off a reef at Recife in March 1943 (Lamm 1948), and a record reported by Coelho (1978) without precise locality or date. According to Coelho (*in litt.* 2003), this was based on some individuals he observed at Olinda, but he could not recall the date. Adults tend to stay around colonies, while young and non-breeders disperse widely (del Hoyo *et al.* 1992). The age of those individuals recorded in PE could not be determined, but they were probably juveniles on dispersal.

MAGNIFICENT FRIGATEBIRD *Fregata magnificens*

Lamm (1948) and Coelho (1978) mentioned the species' occurrence in PE, but did not provide localities or dates. According to Coelho (*in litt.* 2003) his record was based on some individuals he observed at Olinda on 7 July 1977. Azevedo-Júnior (1998) reported a juvenile flying over Coroa do Avião on 20 December 1988. Two juveniles were seen at the same locality on 27 February and 22 September 2003 (CJC & CEF). In addition, three were seen over Itamaracá Island on 23 August 2003 (CJC & CEF).

SOUTH POLAR SKUA *Catharacta maccormicki*

This transequatorial migrant breeds on the Antarctic continent and peninsula, and moves north in the non-breeding period as far as Alaska and Greenland (del Hoyo *et al.* 1996). Coelho (1977) reported one, originally banded (567.61211) at Ross Island (Antarctica) that escaped from Baltimore Zoo (USA) on 3 December 1969, and was caught by fishermen on 4 December 1970, 15 miles off Recife. Lara-Resende & Leal (1982) noted one, probably recovered in PE, but did not provide a precise locality, date or band number. UFPE obtained a dark morph (3137; male; ec 44.81, tc 53.40, wl 400, tr 59.84, ta 155, tl 600) caught by fishermen at Porto de Galinhas beach (*c.*08°24'S, 35°04'W), municipality of Ipojuca on 14 April 2000.

POMARINE SKUA *Stercorarius pomarinus*

A Holarctic migrant that winters at sea, mainly between the Tropic of Cancer and the equator, and off Australia (del Hoyo *et al.* 1996, Wiley & Lee 2000). In Brazil, it is known from São Paulo, Rio Grande do Sul, and from one record near the mouth of the rio Tapajós, Pará (Olmos 2000). On 22 May 2003, a dark morph was observed pursuing Common *Sterna hirundo* and Cayenne Terns *Thalasseus sandvicensis eurygnathus* near Coroa do Avião (CJC & CEF), the first record in north-east Brazil. According to Wiley & Lee (2000), return migration commences in mid April and extends to early June.

SANDWICH TERN *Thalasseus sandvicensis acuflavidus*
The first record from PE was reported by Lamm (1948), and consisted of a few individuals in a mixed flock with Common Terns *Sterna hirundo* near Recife on 8 October 1944 for several days. Thereafter there were no state records until up to four were seen at Coroa do Avião on 22–24 May, 19 July, 24 August and 22 September 2003, in mixed flocks with Cayenne *T. s. eurygnathus* and Common Terns (CJC & CEF). According to Voous (1977), misidentification involving the similar Cayenne Tern is common, as the two may flock together, at least in north-east Brazil (Teixeira *et al.* 1988, Sick 1997). However, Sandwich Tern is smaller and has an obvious black bill (from the base) with a small yellow tip, whilst Cayenne Tern may have a black bill but always has some yellow at the base and/or along the gonys (e.g. Junge & Voous 1955).

ROSEATE TERN *Sterna dougallii*
This tern breeds in North America, the Azores and north-west Europe. Wintering Roseate Terns in South America are primarily of North American origin (del Hoyo *et al.* 1996), but birds from the Azores have been caught in Bahia (Hays *et al.* 1997, 1999). Lara-Resende & Leal (1982) reported a specimen banded in North America that was recovered in PE, but did not provide a precise locality, date or band number. A juvenile was mist-netted at Coroa do Avião on 24 October 2003 (SMAZ). Measurements were: ec 28.9, wl 246, tr 12.5 and ta 110. It was moulting the fourth primary.

LEAST TERN *Sterna antillarum*
Breeds in eastern North America, Honduras and the Caribbean to north Venezuela, and winters in north Brazil (del Hoyo *et al.* 1996), but has been recorded south to Rio de Janeiro (Sick 1997). A juvenile (UFPE 3986; ec 25, wl 158, tr 16 and ta 64; weight 40 g; collected by S. M. Azevedo-Júnior) was mist-netted at Coroa do Avião on 26 October 2003.

YELLOW-BILLED TERN *Sterna superciliaris*
Restricted to South America, where it inhabits rivers, lakes and estuaries (Harrison 1985, del Hoyo *et al.* 1996). One was mist-netted at Coroa do Avião in October 1992 (Azevedo-Júnior 1998). At the same locality, an adult was observed foraging with a flock of Common Terns *S. hirundo*, and roosting on a sandbar with various shorebirds, on 21 June 2003 (CEF).

Concluding remarks

Besides such residents as boobies, frigatebirds and terns, the seabird community in PE (including the Fernando de Noronha archipelago), as well as elsewhere in north-east Brazil, includes (1) boreal migrants (e.g. Cory's Sheawater), en route to and from their wintering areas in southern South America; and (2) Southern Ocean birds (e.g. Atlantic Yellow-nosed Albatross), undertaking northward movements along the Brazilian coast in the austral winter. Pelagic taxa are more common in April–May, when some may be found dead on beaches (Lamm 1948, Azevedo-Júnior 1991, this work). According to Olmos *et al.* (1995), strong winds associated with cold fronts originating in Antarctica may be important in explaining this phenomenon of seasonal mass mortality on the north-east Brazilian coast.

Another point to stress is that there are few studies of seabird distribution off north-east Brazil. Antas (1991) noted that ornithologists interested in seabirds are mainly resident in southern Brazil, and the lack of seabird studies in PE may explain the relative lack of records of common taxa such as Manx Shearwater and Sandwich Tern. Continuous surveys will probably reveal that both Northern Hemisphere and Southern Ocean breeders are more common in the region than previously supposed.

The occurrence of seabirds in a region dominated by sandy beaches and where the sea is oligotrophic is apparently linked to the high supply of nutrients from mainland ecosystems such as estuaries and associated mangroves, e.g. the mouth of the rio São Francisco, in Alagoas (Sousa 1993), and Mangue Seco, in Bahia (Hays *et al.* 1999). Furthermore, some near-shore shelf breaks are also important in recycling nutrients (Olmos 2001).

The Canal de Santa Cruz estuarine complex (including Itamaracá Island and Coroa do Avião islet), with its five river estuaries and *c.*32 km^2 of mangrove swamps (Barros *et al.* 2000) may be another relatively productive area, and it is unsurprising that most seabird records from PE are from this region, although it should be noted the area is near a large urban centre (Recife) and field surveys have been concentrated there. Thus far, 47 waterbird taxa have been recorded in this complex (Azevedo-Júnior 1998, Fedrizzi 2003, this work), and it was recently listed as important for Brazilian seabird conservation (MMA 2002). Despite its biological importance, the region suffers from uncontrolled tourism, and urban and industrial pollution. Urgent efforts must be made to ensure effective conservation for the Canal de Santa Cruz environment and its birds.

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On the type locality of the Cordilleran Buzzard *Buteo poecilochrous*

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In describing the type locality of *Buteo poecilochrous*, Gurney (1870) mentioned that the bird came from Yauayacu in Ecuador and that the specimen was sent, in 1877, from Ecuador to Messrs. Salvin & Godman in London by a certain Mr Buckley.

Hellmayr & Conover (1949) claimed that Yauayacu is in fact a transcription error, and the real name of the site in Ecuador is Yanayacu. Vaurie (1962) questioned this conclusion and stated that the type locality of *B. poecilochrous* corresponds to a place named Sarayacu. Vaurie (1962) based this on the fact that Buckley's collectors established camp in this place (also currently known as Pacayacu on some maps), on the eastern slope of the Andes (01°34'S, 77°30'W) at 1,500 m, south of Canelos on the río Bobonaza. Vaurie (1962) also claimed that Yanayacu is in truth on the río Corrientes in Peru (03°02'S, 75°15'W).

Nevertheless, the same author also believed that Sarayacu is too low for the Puna Buzzard to be found, since this species is typical of the high Andes, and it was possibly captured at higher altitude. Chapman (1926) also suggested this and stated (p.728) that the 10,000 skins of 800 species could not all have been collected around Sarayacu, and that some came from higher up, around the headwaters of the río Pastaza and the montane spurs between this river and its tributary, the río Bobonaza.

Chapman (1929) subsequently explained that the collection was labelled by Buckley's agent, Gerard, after it reached London. Most specimens are credited as being from Sarayacu. Vaurie (1962) concluded that 'there is a great deal of room for error and the type specimen was probably not captured at this locality'.

We agree with Hellmayr & Conver (1949) that the locality 'Yauayacu' is a transcription error of the Quechua word yanayacu, which means 'black water' (yana = black, yacu = water). Such-named localities are common in all of the countries in which the Quechua culture was present, especially in Peru. Our reasons for believing this are as follows: no place in Ecuador called Yauayacu has ever been located; a place called Yanayacu undetected by Vaurie (1962) exists in Ecuador above the headwaters of the ríos Pastaza and Bobonaza (01°25'S, 78°39'W) and between the volcanoes of Carihuarazo, Tunguragua, Chimborazo and Culicasanza; this locality is less than 90 km from Buckley's base camp and has all the ecological requirements of altitude (3,000 m +) and open rocky *páramo* that correspond to the habitat of the species (Solís & Black 1985, Ortiz-Crespo 1986, Fjeldså & Krabbe 1990, Cabot 1991). Sarayacu lies at low altitude in the eastern Andes where the predominant habitat is humid tropical forests, occupied by species other than *Buteo*. Thus, we agree with Hellmayr and Conover (1949) that the type locality of *Buteo poecilochrous* is Yanayacu.

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Steppe Eagle *Aquila nipalensis* is monotypic

by William S. Clark

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Steppe Eagle *Aquila nipalensis* breeds in steppe habitats more or less continuously from Mongolia and central China west to eastern Europe, and is generally considered to comprise two subspecies. Western *orientalis*, reportedly differs from eastern *nipalensis* in its smaller size, paler coloration and lower frequency of pale nape patches on adults (Vaurie 1965, Dementiev & Gladkov 1966, Meyburg 1994, Ferguson-Lees & Christie 2001).

Hodgson (1833) described *A. nipalensis* as a new species. Cabanis (1854), in a footnote, described another new species of eagle as *Aquila orientalis*, based on specimens taken in European Russia. He stated in a terse, incomplete plumage description only that they are larger than Greater Spotted Eagles *A. clanga* and have rather distinct pale bands in the tail; one specimen had several pale nape feathers, which he attributed to a retained juvenile nape patch, such as shown by juvenile Lesser Spotted Eagle *A. pomarina*.

Hartert (1913) found that *Aquila orientalis* Cabanis, 1854, as well as *A. moglnik* (Gmelin 1770), *A. pallasi* (Brehm *et al.* 1856) and *A. glitschii* (Severtzow 1875), were all referable to the western form of Steppe Eagle, which he called *A. nipalensis orientalis*. He considered this form as impossible to reliably separate from the eastern form, but nevertheless treated *orientalis* subspecifically and presented mensural data to demonstrate that *orientalis* by sex averaged smaller. He felt that eastern adult specimens were darker than western ones because they were in fresher (hence darker) plumage. Hartert & Steinbacher (1936–38) stated that eastern Steppe Eagles are, on average, larger than western birds, albeit with much overlap, but found no other differences. They also considered *orientalis* a 'form' and clearly did not advocate recognition of two subspecies, as they listed no trinomials, a fact apparently overlooked by subsequent authorities.

I found that all adult individuals of Steppe Eagle, in collections and in photographs, from throughout the species' range vary little in their dark coloration and all have pale nape patches, as shown in Clark (1999). Clinal size variation is the only difference between eastern and western Steppe Eagles (Hartert 1913, Dementiev & Gladkov 1966, Ferguson-Lees & Christie 2001). Thus, I recommend that Steppe Eagle be considered monotypic, following the rationale of Amadon (1953) and Temple (1982) that clinal variations are insufficient for recognising subspecies.

Methods

I examined more than 300 specimens of Steppe Eagles in many museums, including more than 100 adults, as background for my papers on the species' taxonomic status

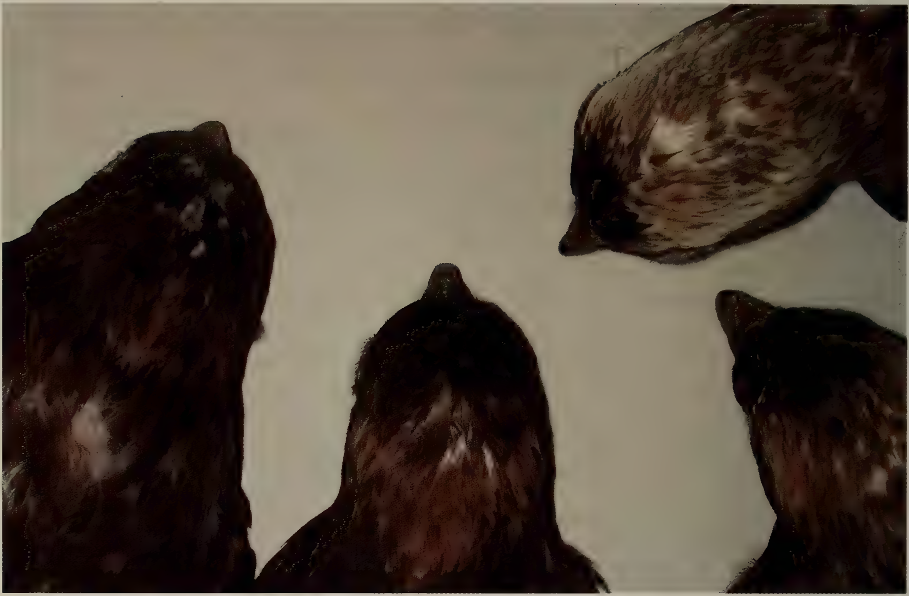

Figure 1. Adult Steppe Eagle *Aquila nipalensis* nape patches. Nape patches of adults vary (left to right) from small to medium to large to (top) very large, including the rear crown (William S. Clark)

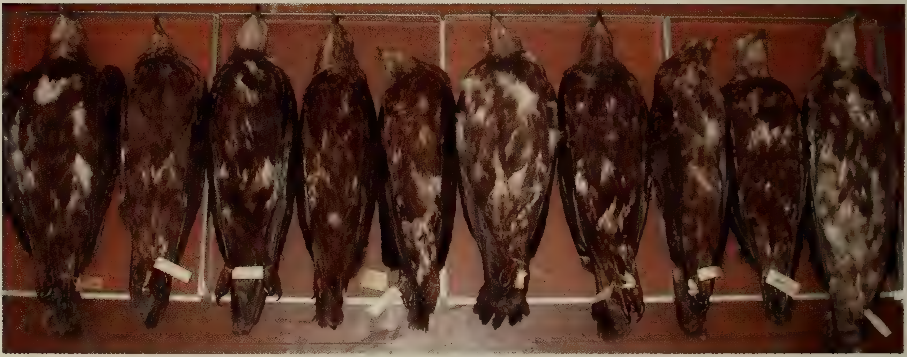

Figure 2. Adult Steppe Eagles *Aquila nipalensis*, west to east. Underparts of adults vary from medium brown to dark brown. Collecting locations of these adults (left to right) are Romania, Ethiopia, Eritrea, Somalia, Israel (Palestine), Iran, Russia, Burma, Central Asia and Mongolia (William S. Clark)

(Clark 1992) and description of its age classes (Clark 1996). I have studied and photographed more than 100 adult Steppe Eagles throughout the range, in China, India, Israel, Kenya, Oman and South Africa. More recently, I examined three adult specimens in the US National Museum, in Washington DC (USNM), two from India (presumably *nipalensis*) and one from Kenya (presumably *orientalis*); five adults in the bird collection of the National Museums of Kenya, in Nairobi (NMK), taken in Kenya (presumably *orientalis*); and ten adults of both taxa, from all parts of the range, in the American Museum of Natural History, New York (AMNH). I scored the colour of the underparts of each as dark brown, medium dark brown or medium brown, and judged their nape patches as absent, small (2–3 cm), medium, large or very large (if extending onto the crown). Adult Steppe Eagles have all secondaries with broad dark subterminal bands and dark undertail-coverts, as described and depicted in Clark (1996, 1999).

Results

All adult Steppe Eagles studied in the field, in photographs or the museum had pale nape patches, varying from small to very large and covering the entire nape and hindcrown (Fig. 1). Some small nape patches were not uniformly pale, being formed by pale tips to as few as ten central nape feathers. The size of the pale nape patches of the ten adults in AMNH varied: two had small patches, three medium patches, three large patches, and two had patches that were large but also extended onto the rear crown (Fig. 1). The sizes of the nape patches in the five adults in NMK were: two small, two medium and one very large; and the three adults in USNM had small (two) and large (one) patches.

The underparts of five of the ten adults in AMNH (Fig. 2) were judged dark brown, three medium dark brown, and two medium brown; they are arranged in Fig. 2 by collection location from west to east. There was no pattern of darker adults from either east or west, but there were more 'paler' medium brown adults from eastern locales. The adults in NMK and USNM were also dark brown, with slight variation but no clear geographic difference in overall coloration.

Discussion

One of the problems of validating racial differences in Steppe Eagle has been that most authorities considered them as races of Tawny Eagle *A. rapax*. Clark (1992) presented rationale for considering Steppe and Tawny Eagles as separate species.

Apparently all authorities (e.g. Vaurie 1965, Dementiev & Gladkov 1966, Ferguson-Lees & Christie 2001) ignored the contrary findings of Hartert & Steinbacher (1936–38) and followed Hartert (1913) in validating the subspecies and accepting published characters distinguishing the alleged races of Steppe Eagle, without examining specimens of adults to verify the validity of such purported characters. As Glutz von Blotzheim *et al*. (1971) covered just Europe, where only the western form occurs, they did not address the validity of Steppe Eagle races, but nevertheless stated that *orientalis* is found in Europe.

Previous to Clark (1996), adult plumage was not clearly defined. Steppe Eagles in fourth plumage (i.e. that prior to adult plumage) are recognisably different from earlier immatures and somewhat resemble adults, but are noticeably paler, usually do not possess pale nape patches, have pale areas in the undertail-coverts and retain a few immature secondaries that lack broad dark subterminal bands (Clark 1996, 1999). It is possible that some earlier researchers confused such birds with adults, resulting in the theory that not all adults have pale nape patches. It is also possible that some specimens on which Cabanis based his description of *A. orientalis* were actually fourth-plumage eagles and not adult, although he mentioned that one adult had some pale nape feathers. Ellis (2003) reported fourth-plumage Steppe Eagles breeding in Mongolia, providing confirmation of breeding by paler eagles. Immature Steppe Eagles in their first three plumages also display colour differences on their underparts, but these are governed by individual variation and show no geographic pattern.

Alleged racial differences depicted in Sinclair *et al.* (1993) are incorrect. I have never seen an adult Steppe Eagle with grey-colored upperparts, as shown for both races on p.94 of the latter guide. Size differences shown in that guide are intersexual and not the product of geographic origin. In any case, it is unlikely that eastern Steppe Eagles winter in Africa.

Temple (1972) argued that the geographic separation of races which possess merely clinal variation in characters or size is necessarily arbitrary, and that such characters are insufficient justification for recognising subspecies; he recommended that the western taiga race of Merlin, *Falco columbarius bendirei*, be considered a synonym of the eastern taiga race, *F. c. columbarius*, as the only difference is a cline in overall coloration, with eastern birds being darker. Similarly, Amadon (1953) wrote 'I am in sympathy with the present trend to suppress naming of continental races based on gradual clines'. Thus, I recommend that Steppe Eagle be considered monotypic, as the only geographic variation is a clinal difference in size, with eastern birds being marginally larger.

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A replacement name for *Xiphorhynchus fuscus brevirostris* (Pinto 1938)

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Based on the suggestions of García-Moreno & Cardoso da Silva (1997), Lesser Woodcreeper *Lepidocolaptes fuscus* (Vieillot 1818) is now placed in the genus *Xiphorhynchus* Swainson 1827. This revision received support from Irestedt *et al.* (2004) and Aleixo (2004), and was also followed by Dickinson (2003) and Marantz *et al.* (2003). Recent examination of the latter works has identified a duplication of names within the genus *Xiphorhynchus* (Dendrocolaptidae), as the trinomial *brevirostris* is now used for two taxa due to the amalgamation of selected taxa, formerly ranked in two genera, into a single genus.

When García-Moreno & Cardoso da Silva's revision is accepted, use of the trinomial *Xiphorhynchus fuscus brevirostris* (Pinto 1938: 384) becomes erroneous, as the name is preoccupied by *X. chunchotambo brevirostris* (Zimmer 1934: 18), a subspecies of Tschudi's Woodcreeper, and as such it is unavailable. The change from *X. ocellatus brevirostris*, Ocellated Woodcreeper, for Zimmer's taxon, follows the revision proposed by Aleixo (2002) and supported by Marantz *et al.* (2003).

Under all recent placements Pinto's name is unavailable for this taxon following the code of the ICZN (1999). *Lepidocolaptes fuscus brevirostris* Pinto therefore must either be replaced by using a pre-existing name or by providing a new name (ICZN articles 23.1 and 60.3). A lengthy literature review indicates that Pinto's name *Lepidocolaptes fuscus brevirostris* has no available junior synonyms, as it has been a stable taxon. If *Xiphorhynchus fuscus* were to revert to the genus *Lepidocolaptes* then the trinomial would not require such action and it could continue with its former arrangement. In the current circumstances, Pinto's original name of *brevirostris* has been replaced for purposes of homonymy (ICZN article 57.3), but as it stands is available as a junior subjective homonym (article 59.2).

For Pinto's original taxon, we therefore propose the *nomen novum* of *Xiphorhynchus fuscus pintoi*. This has been done to stabilise the nomenclature by replacing the existing name, which has now been shown to be unavailable. *Xiphorhynchus* is a masculine genus (ICZN article 30.1.3) and the trinomial has been chosen to celebrate the family name of that famous Brazilian ornithologist, Olivério Mário de Oliveira Pinto (1896–1981), who first recognised and named the taxon. Pinto's original type materials retain their standing as types for *Lepidocolaptes fuscus brevirostris* Pinto, and also for the allocated replacement name of *Xiphorhynchus fuscus pintoi*.

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First occurrence of *Gygis microrhyncha* in the Hawaiian Islands

by Storrs L. Olson

Received 10 August 2004

Systematics of the white-terns, or fairy-terns (cf. Pratt *et al.* 1987), of the genus *Gygis* is more complex than indicated by their usual treatment as consisting of but a single species. There are at least two and perhaps three species-level taxa within the genus, as outlined in Wingate & Watson (1974) and American Ornithologists' Union (1998), although treated therein as subspecies groups. Pratt *et al.* (1987) recognised two species, *G. microrhyncha*, now mainly confined to the main islands of the Marquesas, and *G. alba* for all other populations. This is misleading, because the greatest differences are between the widespread Indo-Pacific species that takes the specific name *G. candida* vs. *G. alba* of the South Atlantic and *G microrhyncha*. The last two are similar in all of the characters that differentiate them from *G. candida*, except that *G. microrhyncha* is much smaller with a more slender bill. Given the size differences, their vast geographical separation, and the long period of time that they have likely been separated, it seems prudent to recognise *G. alba* and *G. microrhyncha* as separate species.

Specimens of *Gygis microrhyncha* or hybrids with *G. candida* are also known from the Line and Phoenix groups (specimens in the United States National Museum) which, with a fossil and archaeological record showing a former much wider distribution of *G. microrhyncha*, indicate that *G. candida* has been hybridising with and then swamping and replacing *G. microrhyncha* (Holyoak & Thibault 1984, Olson ms), resulting in the current relictual distribution of the latter in the Marquesas.

In the Hawaiian group, *Gygis candida* occurs throughout the small islands of the Northwest chain and on Kaula Rock off Niihau. In the main Hawaiian Islands, *Gygis* is known only from a small colony in Honolulu, Oahu. The first breeding pair was observed in 1961 (Berger 1981) and the colony has since increased to *c*.250 breeding pairs (VanderWerf 2003). From this colony, I have examined an adult (BPBM 159032; for all acronyms see the Acknowledgements) and a juvenile (BPBM 183583), obtained in 1982 and 1994, respectively. The deep base of the bill (bluish in life), reduced loral feathering, longer and more deeply notched tail, and pigmented rachides of the remiges and rectrices identify these birds as *G. candida*. Following independent assessment of geographic variation in *G. candida* (Olson ms), I agree with Holyoak & Thibault (1976) that none of the previously described subspecies of *G. candida* is valid except for the birds of Henderson and Ducie islands in the Pitcairn group, which they named *G. alba* (*=candida*) *leucopes*. Thus the resident Hawaiian populations would be referable to *G. candida candida*.

There is, however, an overlooked specimen of *Gygis* from Oahu that long antedates the establishment of the Honolulu colony. This specimen (BBM 4889), a

TABLE 1

Range and mean of measurements (mm) of *Gygis* and ratio of longest to inner rectrices (indicating the degree of forking): *G. microrhyncha* (n=29) from Ua Pou, Hiva Oa, Tahuata, and Fatu Hiva, Marquesas Islands (AMNH). *G. candida* (n=23) from Necker, Nihoa, Laysan, Gardner Pinnacles, French Frigate Shoal (USNM). For all acronyms see the Acknowledgements.

Taxon	Wing chord	Longest rectrix (LR)	Inner rectrix (IR)	LR/IR
G. microrhyncha Oahu BBM 4889	212	83	64	1.30
G. microrhyncha Marquesas	208–227 (217)	73–87 (79)	59–68 (64)	1.14–1.38 (1.22)
G. candida NW Hawaiian Is.	225–245 (234)	103–120 (113)	63–74 (70)	1.54–1.84 (1.61)

female, was taken on nearly the opposite side of the island at Kahuku, on the northern point of Oahu. It was found 'dead in dooryard after westerly blow' on 21 April 1924 by H. K. Schofield. The specimen appears to be typical of *G. microrhyncha* in its small size (Table 1), slender bill with extended loral feathering, short, shallow-notched tail, and lack of any pigment in the rachides of the tail or wing (except a trace in the outermost primary).

The weather conditions noted at the time the bird was found suggest that it was a storm-driven vagrant. But it would have had to stray far from home long before it could have been blown to Oahu by westerly winds, Oahu being nearly 2,000 km north of the northern Line Islands. There is apparently little information on how far any of the *Gygis* terns normally range at sea away from their breeding grounds (Niethammer & Patrick 1998). This constitutes the first record of *Gygis microrhyncha* for the Hawaiian Islands and is thus a new species for the United States, regardless of whether *G. microrhyncha* is merged with *G. alba* or not.

Acknowledgements

I thank Carla Kishinami for lending specimens from the Bernice P. Bishop Museum (BBM, BPBM), Honolulu. Specimens in the collections of the American Museum of Natural History, New York (AMNH), and the National Museum of Natural History, Smithsonian Institution, Washington DC (USNM), were also consulted. I thank the late John Farrand for assistance with measurement data assembled many years ago. H. D. Pratt commented on the manuscript.

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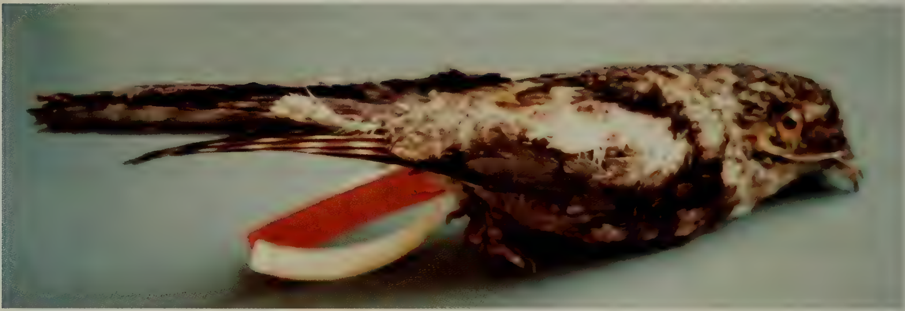
Previously overlooked museum specimens of White-winged Potoo *Nyctibius leucopterus* Wied 1821

by Nigel Cleere

Received 27 December 2004

The enigmatic White-winged Potoo *Nyctibius leucopterus* is one of the smallest and least known of the seven species of potoos (Cleere 1998, Cohn-Haft 1999, Holyoak 2001). It is poorly represented in natural history museum collections, which until recently were thought to contain just two specimens. One is the female holotype, collected in Bahia, Brazil (Wied 1821), the other an unsexed adult (female?) with no supporting data but also thought to have been collected in Brazil. Both are in North American institutions, the holotype in the American Museum of Natural History, New York (AMNH 5867), and the data-less specimen in the Academy of Natural Sciences of Philadelphia (ANSP 22022), both of which I have examined (Figs. 1–2). In addition, four other specimens have been attributed to this species. Lafresnaye (1863) included two specimens in his collection catalogue, an adult male (no. 839) and an adult female (no. 840). The male, now in the Museum of Comparative Zoology, Harvard (MCZ 76549), is actually a Common Potoo *Nyctibius griseus* (pers. obs.), whilst the whereabouts of the female are unknown. Greenway (1978) listed AMNH 5868, a male collected in Bahia in 1817 for Prince Wied-Neuwied, as a syntype, but it too is a *N. griseus* (Chapman 1926, Schulenberg *et al.* 1984, Cohn-Haft 1993). Another specimen, the victim of a road-traffic incident in coastal northern Bahia (Grantsau *et al.* 1999), was re-identified as *N. griseus* by Whitney *et al.* (2003).

Following its description (Wied 1821), White-winged Potoo remained unknown for over 150 years. It was eventually rediscovered near Manaus in Amazonas, northern Brazil, in August 1989, although a roosting bird had previously been observed at the same site in October 1985 (Cohn-Haft 1993). During the pioneering work undertaken by Cohn-Haft, recordings of the bird's vocalisations were obtained, widely circulated and subsequently published by others (e.g. Ranft &



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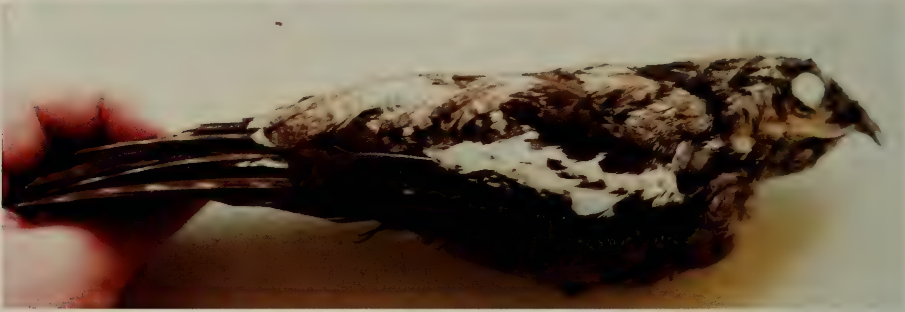

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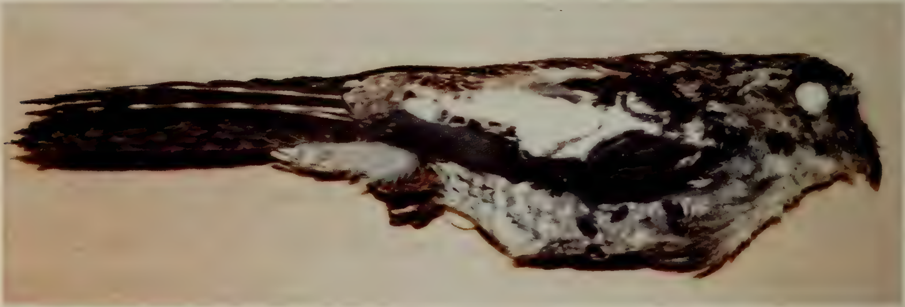

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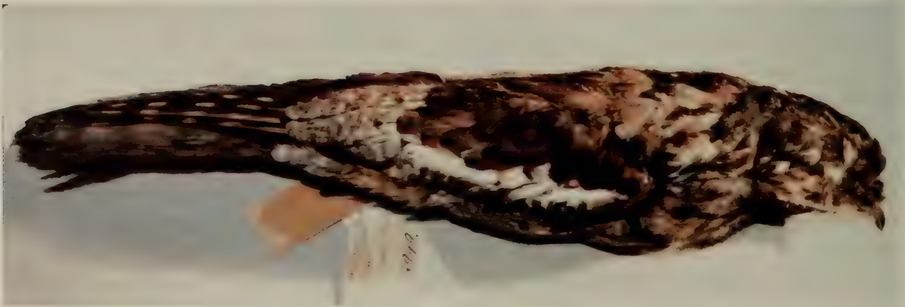

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TABLE 1

Biometrics of the four historical museum specimens of White-winged Potoo *Nyctibius leucopterus*.

Specimen	Sex	Wing (mm)	Tail (mm)
AMNH 5867	female	207	140
ANSP 22022	unsexed	202	132
RBINS 6903	female	222	142
SMF 29869	male	213	136

Cleere 1998). Since its rediscovery, White-winged Potoo has proved to be widely distributed in Amazonia, in northern Peru, central French Guiana, central and south-west Guyana, and at several sites in Brazil (Peres & Whittaker 1991, Parker *et al.* 1993, Borges *et al.* 2001, Alvarez Alonso & Whitney 2003, Claessens *et al.* 2005). At least ten individuals have been collected and deposited in museum collections in North and South America. Based on the consistently small size of these specimens relative to the two historical specimens (Cohn-Haft unpubl. data; NC pers. obs.), Cohn-Haft (1993, 1999) suggested that Amazonian birds represent a distinct population and is currently describing them as a new taxon (M. Cohn-Haft pers. comm.). Meanwhile, the Bahian population was only recently rediscovered (Whitney *et al.* 2003) and continues to lack any modern specimens.

In light of the above, it is important to place on record the existence of two other specimens that date well before the modern records and appear to have gone largely unnoticed in the literature. The first is an adult female (Fig. 3) held in the Royal Belgium Institute of Natural Sciences, Brussels, Belgium (RBINS 6903), collected in Brazil and received from the Verreaux brothers, dealers who were trading in the mid 1800s. The second is an adult male (Fig. 4) collected in America (=Bahia?), deposited in the Forschungsinstitut Senckenberg, Frankfurt, Germany (SMF 29869) that was formerly in the Berlepsch collection (no. 7949). Von Berlepsch, who presumably added Bahia to his label on the basis that it was from the same region as the type, had obtained the specimen from T. C. Eyton, who listed it as species no. 207 in his catalogue (Eyton 1856).

All four historical specimens are similar in size (see Table 1) and plumage (pers. obs.). If birds from Amazonia are smaller and represent a distinct population (Cohn-Haft 1993, 1999), then it appears reasonable to infer that the two 'new' specimens

Captions to plates on opposite page

Figure 1. The adult female holotype of White-winged Potoo *Nyctibius leucopterus* (AMNH 5867) from Bahia, Brazil (Nigel Cleere)

Figure. 2. Unsexed adult (perhaps female) White-winged Potoo *Nyctibius leucopterus* (ANSP 22022) (Nigel Cleere)

Figure 3. Adult female White-winged Potoo *Nyctibius leucopterus* (RBINS 6903) from Brazil (Nigel Cleere)

Figure 4. Adult male White-winged Potoo *Nyctibius leucopterus* (SMF 29869) from Bahia?, Brazil (Nigel Cleere)

represent the third and fourth examples of a non-Amazonian population, which to date is known only from lowland Atlantic Forest in the Brazilian state of Bahia.

Acknowledgements

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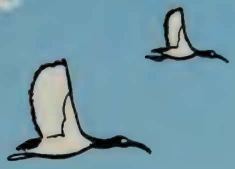

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September 2005

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. (Limited car parking facilities can be reserved [at a special reduced charge of **£5.00**], on prior application to the Hon. Secretary.)

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm.** (A vegetarian menu can be arranged if ordered at the time of booking.) Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges are **£20.00** as from **1 January 2005.**

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

27 September 2005—Dr Colin Ryall—*An assessment of the worldwide spread of the House Crow: present and future*

After completing a research fellowship in microbial ecology at the Institute of Dermatology, Colin took up a series of posts in Africa. In 1984, whilst working in Mombasa and carrying out bird research in his spare time, he first encountered the House Crow *Corvus splendens* and has been hooked ever since. Colin is currently a Senior Lecturer in Environmental Management at Kingston University and has published *c.*50 papers, 13 of them on *C. splendens*. Over the past century or so, *C. splendens*, a native of the Indian region, has spread to all continents except Antarctica, frequently with adverse consequences. This talk will review this invasion and the species' present status, and discuss future potential impacts.

Applications to Hon. Secretary (address below) by 13 September please.

1 November 2005—Dr Russell Wynn—*Chasing migrant seabirds from Europe to Africa, from ship to shore and back again*

Applications to Hon. Secretary (address below) by 18 October please.

6 December 2005—Dr Julian Hume—*The parrots of the Mascarenes*

The Mascarenes (Réunion, Mauritius and Rodrigues) are isolated volcanic islands in the south-west Indian Ocean; due to numerous sea-level changes, bird colonists were able to island-hop to the Mascarenes within the last 5–7 million years from South-east Asia. Using this route, at least 3–4 parrot colonising events took place, with Mauritius and Réunion harbouring three or four sympatric species and Rodrigues two. However, due primarily to man's interference, all of the Mascarene parrots are now extinct bar the Echo Parakeet *Psittacula echo* of Mauritius, and sadly, this species too, is in grave danger of extinction. From an artistic background, Julian Hume returned to academia and studied the vertebrate paleontology of the Mascarenes for a Ph.D., publishing a number of relevant papers as a result. Present projects include a book on the ecological history of the Mascarenes and he was recently awarded a large research grant by the Linnean Society to study the palaeontological history of Aldabra, in the Indian Ocean.

Applications to Hon. Secretary (address below) by 22 November please.

Future meetings in 2006—provisional dates for meetings in 2006 have been set for the following Tuesdays:

24 January, 14 March, 25 April (and AGM), 6 June, 7 November and 5 December. **Speakers to be announced.**

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2006, giving as much advance notice as possible—please contact: S. A. H. (Tony) Statham, Ashlyns Lodge, Chesham Road, Berkhamsted, Herts. HP4 2ST, UK (or e-mail: boc.sec@bou.org.uk).

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CLUB ANNOUNCEMENTS

Members attention is drawn to the inside back cover whereon revised arrangements for membership correspondence, subscriptions and applications can be found. All membership matters should now be addressed to the **BOC Office**, P.O. Box 417, Peterborough PE7 3FX, UK. E-mail: boc.office@bou.org.uk

Correspondence on all general Club matters should continue to be addressed to: The Hon. Secretary, S. A. H. (Tony) Statham, Ashlyns Lodge, Chesham Road, Berkhamsted, Herts. HP4 2ST, UK. E-mail: boc.sec@bou.org.uk

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The 928th meeting of the Club was held on Tuesday 25 January 2005, in the Sherfield Building Annexe, Imperial College, London. 19 members and 6 guests were present.

Members attending were: Dr C. F. MANN (*Chairman*), Sir D. BANNERMAN, Miss H. BAKER, I. R. BISHOP, D. R. CALDER, Cdr. M. B. CASEMENT, Prof. R. A. CHEKE, Dr G. CHILTON (*Speaker*), F. M. GAUNTLETT, D. GRIFFIN, K. M. IDDI, R. H. KETTLE, S. W. LOWE, D. J. MONTIER, P. J. SELLAR, T. R. SMEETON, S. A. H. STATHAM, C. W. R. STOREY and R. P. WEBSTER.

Guests attending were: Lady (P.) BANNERMAN, Ms G. BONHAM, Mrs C. R. CASEMENT, Mrs M. H. G. GAUNTLETT, Mrs M. MONTIER and Dr J. NICHOLSON.

After dinner, Dr Glen Chilton gave an entertaining talk on *Lessons learned from the songs of North American sparrows and warblers.* The following is a brief synopsis.

Birdsong has been studied systematically for more than 200 years. Today's ornithologists are only now substantiating the astute guesses of much earlier investigators. Although it is dangerous to make sweeping generalisations about the behaviour of 4,000 songbird species, some general rules are apparent. Individuals of both sexes learn species-specific songs, but in most cases only the male sings. Performance is the result of higher testosterone levels in males, and captive females treated with testosterone are able to produce a good rendition. The song of a male conveys many messages, including individual identity, place of origin and level of motivation. Males of some species possess just a single song type, but others are capable of performing repertoires of hundreds of song types. The advantage of having a large vocal repertoire is not always clear. Although the vocalisations of non-songbirds are innate, songs must be learned from older members of the species. In many cases, there is a narrow window of opportunity for learning early in life. Learning errors and improvisations are sometimes passed along from one generation to the next. Combined with a degree of fidelity to the place of birth, regional specialisations occur, and these 'song dialects' have been the focus of much study. The songs of some species have been particularly well studied, including those of Chaffinch *Fringilla coelebs* in Europe and White-crowned Sparrow *Zonotrichia leucophrys* in North America. In both species singing is simple enough to be tractable, but sufficiently complex to be interesting.

The 931st meeting of the Club was held on Tuesday 7 June 2005, in the Sherfield Building Annexe, Imperial College, London. 20 members and 5 guests were present.

Members attending were: Cdr. M. B. CASEMENT (*Chairman*), Miss H. BAKER, I. R. BISHOP, Mrs D. M. BRADLEY, Ms D. V. BREESE, Prof. R. A. CHEKE, Dr J. H. COOPER (*Speaker*), F. M. GAUNTLETT, D. GRIFFIN, R. R. LANGLEY, Dr C. F. MANN, Mrs A. M. MOORE, D. J. MONTIER, Mrs M. N. MULLER, Dr R. P. PRŶS-JONES, P. J. SELLAR, Dr S. SOMADIKARTA, S. A. H. STATHAM, C. W. R. STOREY and Cdr. F. S. WARD

Guests attending were: Ms G. BONHAM, Mrs M. H. G. GAUNTLETT, Mrs M. MONTIER, C. MULLER and E. SALHOLM.

After dinner Dr Joanne Cooper gave a most interesting and original talk entitled *A Tomb Wader exposed—X-raying the birds of the gods.* The following is a brief synopsis.

The Natural History Museum holds a substantial collection of ancient Egyptian animal mummies, including some 60 birds, in various states of preservation. Though very few of the birds are now accompanied by good provenance, the majority are believed to have been part of a donation made by the archaeologist William Flinders-Petrie in the late 1880s. Initial investigations of the bird collections seem to have been undertaken in the early 1900s, consisting of unwrapping specimens to establish the identity of their contents. Happily, further specimens were left intact and their contents simply guessed from the shape of the wrapped mummy. In 2000, new examinations of the bird mummies were undertaken by myself, funded by a grant from the Friends of the Natural History Museum. The entire collection was scrutinised externally, and all specimens in suitable condition were X-rayed using the NHM's own facilities. As in previous research, the initial concern was to identify the preserved birds. The majority of the collection comprises various raptors, small falcons being the most common. A limited selection of other species are also present, including Sacred Ibis *Threskiornis aethiopicus* and a rare example of a mummified Spur-winged Plover *Vanellus spinosus*. However, studying the X-rays has also provided considerable information on the preparation of specimens. Many show broken limbs and some have severely damaged necks—possibly from having been sacrificed. Additionally, a number are mutilated in some way, for example lacking feet. By contrast, other specimens have been wrapped with extra parts; the most extreme case includes remains of perhaps four other birds in addition to the main, largely intact, bird. Investigation of the collection continues, and the complete results will be published in due course.

A memorial in Queensland to the ornithologist John Gilbert

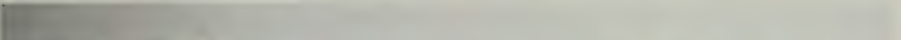
John Gilbert (1812–45) was a taxidermist at the Zoological Society of London, under John Gould. In 1838, Gould travelled to Australia to investigate the vertebrate fauna, particularly birds, at that time almost unknown. Gilbert assisted, and they collected first in Tasmania. In 1839 Gilbert went to Western Australia, where he took many novelties, including Noisy Scrub-bird *Atrichornis clamosus*, Malleefowl *Leipoa ocellata* and Gilbert's Whistler *Pachycephala inornata*. The Cobourg Peninsula, in northernmost Northern Territory, also yielded new species, e.g. Yellow White-eye *Zosterops lutea* and Dusky Honeyeater *Lichenostomus unicolor*.

In 1844 Gilbert worked north from Sydney to the recently settled Darling Downs, now in southern Queensland, where two significant events occurred: Gilbert's discovery of Paradise Parrot *Psephotus pulcherrimus*, a beautiful bird now sadly almost certainly extinct, and his fateful meeting with the explorer-naturalist Ludwig Leichhardt, who was planning an expedition across Australia. The entire route, from Darling Downs to the British outpost of Port Essington, was then unknown territory. Gilbert joined the Leichhardt Expedition, consisting of ten men and their animals, which left on 1 October 1844. Farmers, who settled along the route of the expedition, later opened up much of eastern and northern Australia. Gilbert discovered further bird species, notably White-browed Robin *Poecilodryas superciliosa*, but was killed by an Aboriginal spear during an attack in the Cape York area. The site of Gilbert's grave is unconfirmed, although investigations continue.

As part of a 'Ludwig Leichhardt Expedition Exposition' in September 2004, a memorial to John Gilbert has been constructed at 'Gilbert's Lookout', a hill on the outskirts of Taroom. Gilbert wrote in his expedition diary about the wonderful view from here, over the valley named Dawson. The memorial, which has a directional marker and is flanked by two information plaques, was unveiled following a church service attended by over 400 people. Research on birds recorded by Gilbert during the expedition continues, and his material is being compared with species found on modern surveys by Bruce Lawrie, providing valuable information on how the avifauna has changed since the 19th century, and implications for future conservation.

Dr Clemency Fisher, Curator of Birds & Mammals,
Dept. Science, National Museums Liverpool, UK.

The Gilbert Memorial in Taroom, southern Queensland, shortly after it was unveiled on 26 September 2004. From left to right: Bernd Marx, Curator of the Leichhardt Museum, Trebatsch, Germany; Adam Clark, President of the Wildlife Preservation Society of Queensland (Upper Dawson Branch); Clemency Fisher, Curator of Birds & Mammals, National Museums Liverpool; Pamela Pearse, descendant of John Gilbert's sister; Leo Joseph, Chair of Ornithology at the Academy of Natural Sciences, Philadelphia; Henry Nix, Emeritus Professor at the National University, Canberra (© Ian Flinders)



Many of Gilbert's specimens are now in the Natural History Museum (Tring), *Naturalis* Leiden, the Melbourne Museum and the Academy of Natural Sciences in Philadelphia, as well as other museums. The best, which mostly remain as Gilbert originally prepared them and with his labels still attached, are in the Liverpool Museum, National Museums Liverpool, UK (Keith Sweeney, © National Museums Liverpool)

The nomenclature of Eduard Rüppell's birds from north-east Africa

by Frank D. Steinheimer

Received 4 July 2004

Although explored by the Egyptians, Romans and Portuguese, Abyssinia was scientifically more or less unknown at the dawn of the 19th century. Early travellers were more fascinated by the region's culture than its natural history, with some exceptions (cf. Foster 1949). A collection-based survey combined with first-hand field notes on the avifauna of what was then named Abyssinia was not undertaken until the German Wilhelm Peter Eduard Simon Rüppell (1794–1884) left Frankfurt am Main for Arabia and North Africa in 1822. When he returned to Frankfurt in 1834, Rüppell had amassed a very large collection of vertebrates from the Abyssinian region, which formed the basis for his well-known contribution to the ornithology of Abyssinia (Cretzschmar 1826–30, Carus 1872, Hartert 1891, Sharpe 1906, Mertens 1949, Steinbacher 1949, Stresemann 1951, Gebhardt 1964, Mearns & Mearns 1998, Schmidt & Hackethal 2000, Steinheimer 2003, Walters 2003).

History of Rüppell's explorations in north-east Africa

The first birds from north-east Africa were reported by a Swede named Pehr Forsskål (1736–63; Fors[s]kål & Niebuhr 1775, Sclater 1929). However, any information on Abyssinia available at the end of the 18th century derived principally from a book, *Travels to discover the source of the Nile*, by the Scot James Bruce of Kinnaird (1730–94), who travelled Abyssinia in 1768–73 (Bruce 1790). The ornithological exploration of north-east Africa only commenced in 1805, when the Englishman Henry Salt (1780–1827) reached the Abyssinian highlands during expeditions in 1805–06 and 1809–10 (Salt 1814, Largen 1988). Salt's ornithological collections were subsequently obtained and studied by Lord Stanley (1775–1851), later to become the 13th Earl of Derby, who named several new species of Abyssinian birds (Stanley 1814). Thereafter, John Latham (1740–1837) continued investigating Salt's material (Latham 1821–24). Next to explore Nubia and Abyssinia were the Prussians Wilhelm Friedrich Hemprich (1796–1825) and Christian Gottfried Ehrenberg (1795–1876) in 1820–26, who enriched the collection of Berlin Museum by 4,671 specimens of 429 bird species (Humboldt 1826, Hemprich & Ehrenberg 1828, Stresemann 1954, Gebhardt 1964, Klausewitz 2002, 2003). Unfortunately, due to Hemprich's early death, the published ornithological results were rather incomplete (Hemprich & Ehrenberg 1828, 1829, 1833, Stresemann 1954). Simultaneously, Frédéric Cailliaud (1787–1869) explored the province of Sennar, although his travels are better known to entomologists, mallacologists and botanists, rather than to ornithologists, due to his focus (Cailliaud 1826–27).

Rüppell visited Arabia and North Africa four times, first in 1817, when his professional connections as a volunteer for a trading company, based in the Italian city of Livorno, enabled him to explore Egypt. Rüppell was at that time mainly interested in archaeology (no bird specimens were collected), but he did join the naturalist Henry Salt for a spell. During this first encounter with Africa, Rüppell made the decision to return and explore north-east Africa scientifically. During the second trip, the first bird collecting trip, in 1822–27, he travelled the Sinai Peninsula, Egypt, Nubia, Kordofan, around the Nile estuary and along the coast of the Red Sea south to Massawa. The third journey, in 1831–34, brought him back to the Sinai Peninsula, Egypt, and along the coast of the Red Sea to Massawa, but Rüppell also advanced into the highlands of Ethiopia as far south as Lake Tana. A fourth voyage to Egypt in 1849–50 procured only a few bird specimens. Of importance to the history and especially the type status of some of Rüppell's specimens is that, whilst he twice collected birds in the Sinai Peninsula, Egypt and along the coast of the Red Sea to Massawa, he only once collected in Nubia and the Kordofan (second trip, first collecting expedition) and the Ethiopian highlands (third trip, second collecting expedition). Specimens from the Red Sea, for instance, cannot certainly be linked to one or the other trip if these data are missing, as Rüppell obtained birds on the coast of the Red Sea during both the second trip (in 1822, 1826–27) and on the third visit (1831–32) (Rüppell 1834). Obviously, not all the specimens were collected by Rüppell himself, but by the local hunters he employed and Rüppell's own servants. On his first collecting expedition Rüppell was accompanied by the young surgeon Michael Hey (in Rüppell's service from 1822, born in Rüdesheim, died at Cairo in 1832), the Dutch hunter Franz Lamprecht (from 1823; the hunter Leonhard Geis was sent home prior to the start of the expedition in 1822), by a Matthias Lindemann and by the Prussian soldier Friedrich Dienst (worked for Rüppell in 1826). In 1825, two former members of Ehrenberg & Hemprich's expeditions joined Rüppell's party: the Italian painter Finzi (with Rüppell in 1825–26) and the Moravian hunter and taxidermist Martin Bretzka (from 1825; *fl.* 1820–42). Hey and Bretzka returned to and stayed in the region, Bretzka also collecting birds. When Rüppell revisited Africa during his second collecting expedition, i.e. his third African trip, in late-December 1830, he had a new personal servant with him: Theodor Erckel. Baron Friedrich Heinrich von Kittlitz (1799–1874), who hoped to join Rüppell's expedition, was forced to return to Europe in spring 1831 due to illness (Niethammer 1971). Rüppell filled the vacancy with Matthias Lindemann again.

Those birds in Rüppell's collection from north-east Africa obtained post-1833 in the province of Shoa were collected by Bretzka. Rüppell acquired and subsequently donated Bretzka's birds to the Senckenberg Museum at Frankfurt in 1841 (Rüppell 1845, Hartert 1891). Others of Bretzka's bird specimens were sold to the British Museum,[1] London (BMNH archives: DF200/145/10).

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[1] Zoology Department, British Museum; later British Museum of Natural History, today's Natural History Museum, London/Tring (BMNH).

However, not all birds assigned to Rüppell were collected by him or for him. Some have totally different origins: Steinheimer (2002) referred to a specimen of *Pteroptochos megapodius* from Chile, which, although the label bears the name Rüppell, was collected by Friedrich Heinrich von Kittlitz in spring 1827 during the circumnavigation of the Russian ship *Senjawin*. Others are from Africa, but from localities that Rüppell and his collectors never visited. A male *Foudia madagascariensis* (ZMB 7272) in the collection of the Berlin Museum, which must be from Madagascar, carries a label bearing 'Abyssinia Rüppell', although it could not have been collected by Rüppell. The same is true of a *Coracopsis nigra* (ZMB 26623), also from Madagascar. It seems probable that Rüppell did not only acquire Abyssinian birds, but purchased additional species in local markets along the Red Sea coast.

Rüppell also worked on birds in other collections, naming new taxa on the basis of other people's material. For his *Systematische Uebersicht der Vögel Nord-Ost-Afrika's* (Rüppell 1845) he consulted specimens procured on Sir William Cornwallis Harris' (1807–48) trip to Abyssinia in 1842,[2] and raptors from the collection made by Paul Wilhelm von Württemberg (1797–1860) on his voyage to Sennar in 1839–40. These specimens are now at BMNH and the Staatliches Museum für Naturkunde, Stuttgart (Horsfield & Moore 1854, Sharpe 1906, Roselaar 2003).

Whilst Bruce (1790) and Salt (1814) depicted Abyssinia as being out of reach for any traveller due to warfare and frequent humiliations, Rüppell (1838/1840) encouraged Europeans to explore the region scientifically. Apparently the religious fanaticism had declined over the years. Consequently Rüppell was followed in his Abyssinian and north-east African explorations by Johan Hedenborg (1787–1865) in 1835 and 1837–39 (Sundevall 1850, Lönnberg 1926, Horn *et al.* 1990), Paul Wilhelm von Württemberg (1797–1860) in 1839–40 (Gebhardt 1964), Pierre Victor Adolphe Ferret (1814–82) and Joseph Germain Galinier (1814–88) in 1839–43 (Ferret *et al.* 1847–50, Guérin-Méneville 1843), Charlemagne Théophile Lefebvre (1811–60) in 1839–43 and 1847–54 (Lefebvre 1845–51, Didot & Hoefer 1859), Richard Vierthaler (1820–52) in 1847–52 (Vierthaler 1852, Gebhardt 1964), Alfred Edmund Brehm (1829–84) in 1847–51 and 1862 (A. E. Brehm 1855b, 1863), John Petherick (1813–82) in 1848–59 (Petherick 1861, Petherick & Petherick 1869), Theodor von Heuglin (1824–76) between 1852 and 1875 (Heuglin 1856, 1869a,b, 1871, 1873), Adalbert Johann Baptist Freiherr von Barnim (1841–60) and Carl Eduard Wilhelm Robert Hartmann (1832–93) in 1859–60 (Schweinfurth 1862, Hartmann 1863, 1864, Gebhardt 1970), William Jesse (*fl.* 1860s–1874) and William Thomas Blanford (1833–1905) in 1868 (Blanford 1868, Jesse 1869, Finsch 1870, Godwin-Austen 1905, Sharpe 1906), Emin Pasha alias Eduard Schnitz(l)er

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[2] BMNH obtained 54 of Harris' Shoa specimens from the East India Company Museum in 1845. Harris gave a vivid narrative account of his travels, but focused more on big game, native people, battles and regional Christians than the Abyssinian avifauna (Harris 1844).

(1840–92) from *c.*1875 until 1892 (Gebhardt 1964), Orazio Antinori (1811–82) in 1859–61 and 1878–82 (Antinori 1864, Hartmann 1865, Violani & Barbagli 2003), Vincenzo Ragazzi (1856–1929) in 1884–86 (Violani & Barbagli 2003), Vittorio Bottego (1860–97) in 1895–97 (Violani & Barbagli 2003), Carlo Freiherr von Erlanger (1872–1904) in 1899–1901 (Erlanger 1904b), Gustav Schrader (1852–1942) in 1899–1903, Oscar Neumann (1867–1946) in 1900–01 (Neumann 1902, 1903, 1904, 1905, 1906, 1928) and Otto Graf von Zedlitz & Trützschler (1873–1927) in 1908–09 (Zedlitz 1910), to name but a few.[3]

Rüppell's and Cretzschmar's ornithological publications

Rüppell published two major works on the ornithology of Abyssinia, *Neue Wirbelthiere zu der Fauna von Abyssinien gehörig—Vögel* (Rüppell 1835, 1836, 1837a, 1840), and *Systematische Uebersicht der Vögel Nord-Ost-Afrika's* (Rüppell 1845), as well as several papers mainly in the journal *Museum Senckenbergianum* (Rüppell 1837b–d, 1839, 1842a,b). Whilst Rüppell was occupied on his second voyage, his colleague and head curator of the Senckenberg Museum, Philipp Jakob Cretzschmar (1786–1845), produced the work *Atlas zu der Reise im nördlichen Afrika von Eduard Rüppell—Vögel* (Cretzschmar 1826, 1827, 1828, 1829, 1830), describing 30 bird species new to science. I follow Steinbacher (1949) and Sawyer (1952) for publishing years of the original descriptions, which differ slightly to Zimmer (1926), Peters *et al.* (1934–87) and Dickinson (2003). At the Senckenberg Museum of Frankfurt I have personally checked the wrappers of Cretzschmar's work, issues five, seven, eight and fourteen (1827, 1828, 1828, 1829) as well as following wrappers of Rüppell: 1835: nos. 1–4 of the bird descriptions: pls. 1 (*Buceros cristatus*) to 6 (*Perdix Erckelii*); 1836: nos. 5–8 of the bird descriptions: pls. 7 (*Otis melanogaster*) to 12 (*Oriolus moloxita* and *Prionops cristatus*); and 1840: main chapters and introduction, nos. 23–29 of the bird descriptions: pls. 31 (*Cinnyris affinis, C. gularis* and *C. Tacazze*) to 42 (*Curruca cinnamomea* and *Curruca lugens*).[4] No discrepancies to Steinbacher (1949)[5] and Sawyer (1952) have been unveiled.

Some of Rüppell's bird specimens were immediately disposed of after their arrival in Frankfurt, and specimens are found today in many institutions such as the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt (SMF), The Natural

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[3] I have only listed those explorers who collected birds. Many other scientists of the 19th century not listed above went along the Nile, to Sudan and Eritrea.

[4] Plates 31–42 from the 1840 issue consistently lack the note 'Auf Stein gez. v. F. C. Vogel / Gedruckt bei P. C. Stern', shown similarly on all plates of the 1835–1837 issues, except for plates 16, 17 and 20.

[5] However, Steinbacher (1949) later included some errors on publication dates in the type list: *Motacilla longicauda* Rüppell, 1840 instead of 1837; *Ixos leucopygius* Rüppell, 1840, instead of 1837; *Hirundo pristoptera* Rüppell, 1836 instead of 1840; *Corvus affinis* Rüppell, 1835, instead of 1836; *Oriolus moloxita* Rüppell, 1835, instead of 1836; *Cinnyris gularis* Rüppell, 1837, instead of 1840; *Cinnyris affinis* Rüppell, 1837, instead of 1840; *Emberiza septemstriata* Rüppell, 1840, instead of 1837; and *Euplectes abyssinicus* Rüppell, 1835, instead of 1840.

History Museum, Tring (BMNH), Museum für Naturkunde, Berlin (ZMB), Naturalis—Nationaal Natuurhistorisch Museum, Leiden (RMNH), Museo Regionale di Scienze Naturali, Torino (MRSN) and Naturhistorisches Museum, Vienna (NMW). Whilst most museums just acquired Rüppell's avian specimens without working on the material, Coenraad Jacob Temminck (1778–1858), then the director of Leiden Museum, used Rüppell's birds and manuscript names in his own forthcoming publications entitled *Planches coloriées* (Temminck & Laugier 1820–39), thus securing priority of authorship for several new taxa discovered by Rüppell.[6]

This paper discusses these and other nomenclatural issues concerning bird species collected by Rüppell and described by him and by Cretzschmar (see Appendix for a complete list of nomenclaturally valid bird names of Rüppell and Cretzschmar according to the current paper).

Nomenclature

Several points made below draw upon rules or articles laid down in *The international code of zoological nomenclature* (ICZN 1999) (hereafter 'the Code'). The first edition of the code appeared in 1961 (ICZN 1961), and it is important to note that although various initiatives leading towards an international code were made during the second half of the 19th century (cf. e.g. Hartert 1891: XVI–XVIII) no Code was formally agreed. It remains necessary when reviewing old decisions against the new Code to realise that no such guidance was available when Cretzschmar and Rüppell were working.

***Ardea Goliath* Cretzschmar, 1829**: 39, pl. 26[7] *nomen protectum*
= *Ardea goliat* Temminck, 1829b: livr. 80, pl. 474 *nomen oblitum*[8]
= *Ardea goliath* Cretzschmar, 1829

Dickinson (2001) listed the dates of each of the 102 issues of Temminck & Laugier's (1820–39) *Planches coloriées*. Steinbacher (1949) did likewise for Cretzschmar's *Atlas zu der Reise im nördlichen Afrika* (1826–30). Comparing the two, one can restart the debate on the first authorship between Temminck, Rüppell and Cretzschmar. However, only three cases might demand nomenclatural changes: *Ardea goliat* Temminck, 1829b, *versus Ardea goliath* Cretzschmar, 1829, *Saxicola isabellina* Cretzschmar, 1830, and *Malurus clamans* Cretzschmar, 1826 (see below).

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[6] Temminck used Rüppell specimens for the following original descriptions: *Vultur aegypius* Temminck, 1826; *Falco concolor* Temminck, 1825; *Larus leucophthalmus* Temminck, 1825; *Caprimulgus isabellinus* Temminck, 1825; *Caprimulgus eximius* Temminck, 1826; *Alauda bifasciata* Temminck, 1826; *Alauda isabellina* Temminck, 1823; *Alauda bilopha* Temminck, 1823; *Saxicola monacha* Temminck, 1825; *Saxicola melanura* Temminck, 1824; *Saxicola deserti* Temminck, 1825; *Saxicola isabellina* Temminck, 1829a (see below).

[7] Sharpe (1898: 66), followed by Sclater (1924: 24) and Steinbacher (1949: 103), cited the wrong plate number, 36, most likely a typographic error for 26 (A. Peterson *in litt.* July 2004).

[8] The specimen upon which Temminck based his description was not collected by Rüppell. Temminck, however, did include a cross-reference to Cretzschmar's description.

The original description of Temminck's *Ardea goliat* is found in the livraison 80 and can thus be dated 5 September 1829 (Dickinson 2001). Some 19th-century authors referred to Temminck's authorship of the taxon (*goliath* 'Temm.': Hartlaub 1852: 40; Layard 1867: 305; Layard & Sharpe 1875–84: 707). Cretzschmar's description, which used the same name, was also published in 1829, but cannot be fixed to an accurate date. In such cases, ICZN (1999 article 21.3.2) requires adopting the publication date 31 December, in this case 31 December 1829. Nevertheless, most early authors cited Cretzschmar as author (*i.a.* Hemprich & Ehrenberg 1833: m, Heuglin 1873: 1048, Bocage 1877–81: 437, Sjöstedt 1895: 15, Sharpe 1898: 66).

It also does not assist matters that Temminck (1829b) already referred to Cretzschmar's description and plate when writing '*Une figure de cette espèce, prise d'un individu revêtu de la livrée intermédiaire entre le jeune âge et l'état adulte, sera publiée dans l'Atlas du Voyage de M. Ruppel* [*sic*].' Temminck could just have heard about Cretzschmar's project (E. Dickinson pers. comm. 2004). However, the senior synonym[9] *Ardea goliat* Temminck, 1829b, has not been used as a valid name since 1899 (Reichenow 1900–01: 376, Neumann 1904: 339, Erlanger 1905: 106, Stark & Sclater 1906: 55, Reichenow 1911: 252, Hartert 1920: 1234, Berlioz & Berlioz 1923: 9, Roberts 1924: 137, Friedmann 1930: 18, Archer & Godman 1937: 45, Lippens 1938: 19, Malbrant & Maclatchy 1949: 94, Steinbacher 1949: 103; see below), fulfilling article 23.9.1 of the Code (ICZN 1999). In contrast, the junior synonym *Ardea goliath* Cretzschmar, 1829, has been in prevailing usage as the taxon's presumed valid name in more than 25 works published by more than ten authors in 1954–2004 (Cave & Macdonald 1955: 56, Smithers *et al.* 1957: 25, MacDonald & Hall 1957: 5, Mackworth-Praed & Grant 1957: 40, Schouteden 1961: 13, 1962a: 11, 1962b: 12, 1963: 18 [select], Clancey 1964: 30, Vaurie 1965: 75, McLachlan & Liversidge 1970: 28, Wolters 1976: 92, Cramp *et al.* 1977: 318, Payne 1979: 202, Brown *et al.* 1982: 167, Rosa Pinto 1983: 28, Soothill & Soothill 1989: 20, Sibley & Monroe 1990: 304, Martínez-Vilalta & Motis 1992: 407, Dickinson 2003: 87),[10] therefore fulfilling article 23.9.2 of the Code (ICZN 1999).

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[9] Fixed as such by the Code (ICZN 1999 article 21.3.2).

[10] Only those references are given above that cite Cretzschmar as author. The Zoological Records for 1978–2003 show 38 entries for *Ardea goliath* (Cretzschmar's spelling) and none for *Ardea goliat* (Temminck's spelling): Mahdy, O. A. & Shaheed, I. B. (2001) Histopathological study on the effect of *Renicola heroni* on the kidneys of giant heron *Ardea goliath*. *Helminthologia (Bratislava)* 38: 81–83; Kasoma, P. M. B. (2000) Diurnal activity patterns of three heron species in Queen Elizabeth National Park, Uganda. *Ostrich* 71: 127–130; Salewski, V. & Grafe, T. U. (1999) New tape recordings of three West African birds. *Malimbus* 21: 117–121; Kaiser, M. & Richter, R. (1998) Hand rearing of the Goliath Heron *Ardea goliath* in Berlin-Friedrichsfelde Zoo. *Milu* 9: 384–393; Grummt, W. (1996) Further successful breeding of the Goliath Heron (*Ardea goliath*) in Berlin-Friedrichsfelde Zoo. *Milu* 8:

Herewith this paper states explicitly, in the interest of nomenclatural stability, that the younger name *Ardea goliath* Cretzschmar, 1829 (*nomen protectum*), is valid; the action has been taken in accordance with the conditions of articles 23.9.1.1 and 23.9.1.2 (ICZN 1999). The older name *Ardea goliat* Temminck, 1829b (*nomen oblitum*), is henceforth invalid. The Frankfurt Museum holds the lectotype (SMF 12598) and two paralectotypes (SMF 18811, 18812) of *Ardea Goliath* Cretzschmar, 1829.

***Ibis comata* '(Hemprich)' Rüppell, 1837a**: 49 *nomen nudum*
= *Geronticus comatus* 'Licht.' Gray, 1844: 90 *nomen nudum*
= *Geronticus comatus* 'Ehrenberg' Rüppell, 1845: 122, pl. 45

706–713; Kopij, G. (1996) A mixed heronry at Willem Pretorius Game Reserve, Free State Province. *Mirafra* 13: 63–67; Kasoma, P. M. B. (1995) Kleptoparasitic attacks on three heron species (Ardeidae) in Queen Elizabeth National Park, Uganda. *Afr. J. Ecol.* 33: 291–293; Madge, S. (1995) A record of Goliath Heron in Assam. *Bull. Oriental Bird Cl.* 21: 47; Grummt, W. (1993) Erfolgreiche Brut des Riesenreihers (*Ardea goliath*) im Tierpark Berlin-Friedrichsfelde. *Zool. Garten* 63: 303–313; Falzone, C. K. (1989) Breeding Goliath Heron, *Ardea goliath* at the Dallas Zoo. *Aazpa Regional Conf. Proc.* 1989: 741–746; Abbott, T. (1994) A Goliath Heron at Ndumo. *Albatross* 317: 32–33; Tyler, D. & Hahndick, Q. (1993) Goliath Heron in battle. *Promerops* 209: 10; Schels, C. (1993) The second breeding record of the Goliath Heron *Ardea goliath* in Somalia. *Scopus* 17: 59–60; Mahdy, O. A. (1993) On three trematod species infesting the giant heron (*Ardea goliath*) in Giza, Egypt. *J. Egypt. Vet. Med. Assoc.* 53: 305–312; Harris D., Harris, J. & Harris, C. (1993) More Goliath Herons at Chelmsford Dam (Newcastle). *Albatross (Durban)* 316: 5; Euston-Brown, M. (1993) Orange River birds. *Promerops* 209: 11; Davis, S. & Cowgill, R. (1993) Goliath Heron in Natal. *Albatross* 315: 15; Brooke, R. K. (1993) An inland breeding record of the Goliath Heron in Natal. *Albatross* 314: 27; Pauw, R. (1991) Goliath Heron. *Promerops* 199: 16; Blerk, E. van & McFarlane, J. (1990) Goliath Heron in the Little Karoo. *Promerops* 192: 9; Lamont, G. & Myburgh, N. (1990) Records from the Brandvlei-Calvinia area. *Promerops* 194: 7–9; Saikia, P. & Bhattacharjee, P. C. (1990) The present status of waders and other water birds of Brahmaputra Valley, Assam (India). *Stilt* 17: 65–70; Ralph, I. (1990) Goliath Heron eating a large barbel. *WBC News* 150: 8–9; Gold, B. E. (1989) Diet. *WBC News* 147: 6; Dean, W. R. J. (1988) Breeding of the Goliath Heron at Barberspan, Transvaal. *Ostrich* 59: 75–76; Hustler, K. & Games, I. (1987) Goliath Herons feeding at night. *Honeyguide* 33: 58; Kinzelbach, R. K. (1986) New records of Goliath Heron, Yellow-billed Stork, Blyth's Reed Warbler and Clamorous Reed Warbler in the Middle East. *Orn. Soc. Middle East Bull.* 17: 13–17; Geldenhuys, J. N. (1984) Status of the Fish Eagle and Goliath Heron in the Orange Free State, South Africa. Pp. 577–587 *in* Ledger, J. (ed.) *Proc. Fifth Pan-Afr. Orn. Congr.* Southern African Orn. Soc., Johannesburg; Ferguson, D. A. (1984) Ornithological observation in the Hurghada area April 22–May 5, 1982. *Courser* 1: 8–16; Fraser, W. (1984) Strange death of heron. *Bokmakierie* 36: 23; Bijlsma, R. G. & Roder, F. E. de (1982) Goliath Herons in Egypt in 1981. *Dutch Birding* 4: 82–84; Skead, D. M. (1981) Goliath Heron chokes on carp. *Bokmakierie* 33: 51; Guggisberg, C. A. W. (1981) [Africa's heron.]. *Artis* 26: 212–214; Mock, D. W. & Mock, K. C. (1980) Feeding behavior and ecology of the Goliath Heron. *Auk* 97: 433–448; El-Naffar, M. K., Khalifa, R. M. & Sakla, A. A. (1980) Parasitofauna of the Egyptian aquatic birds. 2. Trematode parasites of the giant heron (*Ardea goliath*) in Assiut Governorate. *J. Egypt. Soc. Parasitology* 10: 107–116; Whitfield, A. K. & Blaber, S. J. M. (1979) Feeding ecology of piscivorous birds at Lake St Lucia, part 2: wading birds. *Ostrich* 50: 1–9; Stein, H. (1978) [Goliath Heron in the Netherlands]. *Vogeljaar* 26: 208; Hagen, H. (1978) Leukismus bei einem Nacktkehlfrankolin (*Francolinus ater*) und einem Goliathreiher (*Ardea goliath*). *Orn. Mitt.* 30: 40–44.

= *Ibis comata* Hemprich & Ehrenberg MS (*fide* Rüppell, 1837a, 1845)
= *Ibis Hemprichii* Ehrenberg, 1833: pl. 18
= *Geronticus eremita* (Linnaeus, 1758)

This name had long been attributed to Ehrenberg's authorship (Sharpe 1898: 16), probably on the grounds that birds of this species in the Berlin Museum had been labelled with the MS name *Ibis comata*. However, Ehrenberg (1833: pl. 18),[11] when publishing on the Bald Ibis, finally named the taxon *Ibis Hemprichii* in honour of his early-deceased friend Wilhelm Friedrich Hemprich. Rüppell (1837a: 49) listed '*Ibis comata* (Hemprich)' without any proper description, thus introducing a *nomen nudum*. Gray (1844: 90) followed in the use of the *nomen nudum* in his *List of the specimens of birds in the collection of the British Museum—Part 3 Gallinae, Grallae, and Anseres*. However, one year later, Rüppell (1845: 122, pl. 45) validated the name by publishing it in combination with a coloured plate and reference to Ehrenberg.

The birds seen by both Ehrenberg and Rüppell, belonged to the eastern population of the Bald Ibis, which is on the verge of extinction (BirdLife International 2000). The birds wintered in eastern Sudan, Ethiopia, Eritrea and southern Arabia (Steinbacher 1979).

***Falco* (*Nisus*) *polyzonus* Rüppell, 1836**: 36(–37), pl. 15, fig. 1 & 2 *nomen oblitum, nec Nisus polyzonus* Lesson, 1830: 58
= *Melierax polyzonus* 'Rüpp.' *apud* Rüppell, 1845: 12
= *Nisus polyzonus* Ferret & Galinier, 1850: 179 (*fide* Sharpe 1874: no substitute name)
= *Melierax metabates* Heuglin, 1861b: 72
= *Melierax metabates metabates* Heuglin, 1861b *nomen protectum*

Some of the confusion surrounding this name results from Rüppell's inconsistency in his introduction of subgeneric names (Rüppell 1835, 1836, 1837a, 1840). Whilst Rüppell (1836) placed the subgenus name in parentheses when describing *Falco* (*Aquila*) *albicans*, he subsequently (Rüppell 1836) reversed the hierarchy in *Prionops* (*Lanius*) *cristatus* (cf. Mayr & Greenway 1960: 311). Furthermore, Stresemann & Amadon (1979: 322) treated *Falco* (*Nisus*) *polzyonus* Rüppell, 1836: 36 as preoccupied by *Nisus polyzonus* Lesson, 1830: 58,[12] whilst *Falco* (*Aquila*)

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[11] A set of plates 11–20, now in private hands, originally came in a wrapper dated 1829 (R. J. Dowsett & E. C. Dickinson pers. comm. 2003).

[12] Stresemann & Amadon (1979: 322) consequently used the younger synonym, which is *Melierax metabates* Heuglin, 1861b: 72, for their contribution to Peters' checklist (Mayr & Cottrell 1979). Mathews (1911: 14) dated the first livraison (pp. 1–80) of Lesson's (1830–31) *Traité d'Ornithologie* as published in February 1830.

albicans Rüppell, 1836: 34 was treated as preoccupied by *Falco albicans* Gmelin, 1788: 276 (see below).[13]

Inter alia, Rüppell 1845: 12, Heuglin 1869b: 61, Sharpe 1874: 88, Finsch & Hartlaub 1870: 90, Blanford 1870: 291, Bocage 1877: 12, Cabanis 1882: 229, Rochebrune 1884: 38, Gurney 1884: 26, and Gurney 1894: 20 correctly referred to this taxon as *Melierax polyzonus* (Rüppell, 1836). Thus, according to article 51.3.3 of the Code (ICZN 1999) *Falco polyzonus* Rüppell, 1836, has never been a primary homonym.

Ferret & Galinier (1850: 179), though, in believing Rüppell's *polyzonus* to be congeneric with what was seen as *Nisus* (=*Accipiter*, *fide* Sharpe 1874: 130), produced a secondary homonym of *Nisus polyzonus* Lesson, 1830: 58 from Cape Province [=*Accipiter tachiro tachiro* (Daudin, 1800)] when referring to birds from Abyssinia as *Nisus polyzonus* (Rüppell, 1836), without substituting the name of Rüppell's taxon. *If in a case of secondary homonym the junior species-group name has not been replaced* [...], *and the relevant taxa are no longer considered congeneric, the junior name is not to be rejected, even if one species-group name was originally proposed in the current genus of the other* (ICZN 1999; article 59.2). However, prevailing usage is followed in this case. The following authors (selection) used *Melierax metabates* Heuglin, 1861b: 72, Hartlaub 1861: 100, Heuglin 1869b: 63, Reichenow 1900–01: 544, Erlanger 1904a: 163, Neumann 1904: 360, Hilgert 1908: 368, Hartert 1914: 1164, Gyldenstolpe 1924: 285, Friedmann 1930: 84, Friedmann & Loveridge 1937: 48, Archer & Godman 1937: 254, Moltoni 1943: 136, Steinbacher 1949: 104, Bannerman 1953: 300, Cave & Macdonald 1955: 107, Smithers *et al.* 1957: 42, Mackworth-Praed & Grant 1957: 211, Smith 1957: 20, Toschi 1959: 328, Mackworth-Praed & Grant 1962: 189, Balsac & Mayaud 1962: 43, Williams 1963: 49, Vaurie 1965: 170, Moreau 1966: 74, 243, Schüz 1968: 10, Wolters 1976: 83, König & Ertel 1979: 143, Weick 1980: 90, Cramp *et al.* 1980: 144, Curry-Lindahl 1981: 301, 361, Harrison 1982: 91, Brown *et al.* 1982: 368, Rosa Pinto 1983: 108, Sauer 1985: 52, Nikolaus 1987: 50, Lewis & Pomeroy 1989: 101, Tarboton 1989: 208, Serle & Morel 1990: 42, Sibley & Monroe 1990: 275, Short *et al.* 1990: 77, Morel & Morel 1990: 48, Gore 1990: 48, Thiollay 1994: 143, Williams & Arlott 1996: 47, Zimmerman *et al.* 1996: 346, Clements 2000: 39, Ferguson-Lees & Christie 2001: 510, Borrow & Demey 2001: 379, Stevenson & Fanshawe 2002: 60, and Dickinson 2003: 104.

These references meet the condition of article 23.9.1 and 23.9.2 (ICZN 1999). Herewith it is stated that the younger synonym *Melierax metabates* Heuglin, 1861b, is valid (*nomen protectum*), while the older synonym, *Falco polyzonus* Rüppell, 1836, becomes a *nomen oblitum*.

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[13] Stresemann & Amadon (1979: 380) replaced Rüppell's name by *Aquila rapax belisarius* (Levaillant, 1850) without giving any further details.

Falco **(*****Aquila*****)** ***albicans*** **Rüppell, 1836**: 34(–35), pl. 13 *nec Falco albicans* Gmelin, 1788: 276
= *Falco belisarius* Levaillant, 1850: pl. 2
= *Aquila raptor* A. E. Brehm, 1855a: 13
= *Aquila rapax albicans* Rüppell *apud* Hartert, 1914
= *Aquila rapax belisarius* (Levaillant, 1850)

As shown above, Rüppell (1835, 1836, 1837a, 1840) inconsistently used subgeneric names. The rules of the Code (ICZN, 1999: article 51.3.3) are followed and Rüppell's eagle species is treated within the genus given without parentheses, thus calling the taxon by the correct binomial combination *Falco albicans* Rüppell, 1836. However, Gmelin (1788: 276) had already used the name *albicans* in combination with the genus *Falco*. His *Falco albicans*, however, was based on 'Le Lanier blanc' of Brisson (1760: 367) and the 'White Lanner' of Latham (1781: 87), both copied from Aldrovandi's *Falco albus* (1599: 380, 485).[14] *Falco albicans* Gmelin, 1788, is now considered to refer to the white morph of Gyrfalcon *F. rusticolus*. Consequently, Rüppell's *albicans* is a younger primary homonym. Neither of the two applications of the name *Falco albicans* was recognised in synonomy by Mayr & Cottrell (1979). Whilst 19th and early-20th century authors frequently referred to *Aquila albicans* Rüppell, 1836 (e.g. Salvadori 1888: 15, Neumann 1904: 362), most mid-20th century ornithologists used *Aquila rapax raptor* A. E. Brehm, 1855a, for the same taxon (Friedmann 1930: 58, Moltoni 1937a: 76, 1937b: 220, 1939: 9, 1943: 132, Friedmann 1948: 138, Smith 1957: 19, Toschi 1959: 326, Brown 1972: 189), whilst modern ornithology knows the bird as *Aquila rapax belisarius* (Levaillant, 1850: pl. 2) (Vaurie 1965: 185, White 1965: 56, Stresemann & Amadon 1979: 380, Cramp *et al.* 1980: 216, Brown *et al.* 1982: 407, Thiollay 1994: 193, Ferguson-Lees & Christie 2001: 733, Dickinson 2003: 112). The overall pattern of the adult in Rüppell (1836: pl. 13, fig. 1) is very much like the specimen illustrated in Levaillant (1850: pl. 2), except for the quality of the colour of the wings and tail, which is grey-brown in Rüppell, but hair brown to chestnut in Levaillant. Rüppell's description gives several details of plumage pattern (wing, tail and soft-part colours) and proportions (proportion of wingtip to tail tip), which are well matched by Levaillant's illustration. However, individual variation (especially within the two major colour morphs), as well as age- and sex-related plumage variations, are frequent in this subspecies (Tarboton 1989), making subspecific determination problematic. A. E. Brehm (1855a: 14), for example, still listed Rüppell's taxon as a valid species beside his 'new' taxon of *Aquila raptor*. Hartert (1914: 1095) considered *albicans* different from *belisarius*, not necessarily morphologically, but in choice of habitat: the latter had been described from the Atlas Mountains, whilst the former was found in subtropical areas of north-east Africa.

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[14] Aldrovandi's (1599) p. 380 gives a list of generic characters and an introduction to the birds of prey, naming also already a *Falco albus*, but only pp. 485–486 contain the true species description. The plate on p. 487 shows a 'mythical' white bird of prey, which probably had been illustrated on tales of others, but which certainly refers to a Gyrfalcon. However, on pp. 471–472 (plate on p. 473) a description of the spotted morph of Gyrfalcon, even named *Gyrfalco*, is given as well, which is probably based on a specimen or good original drawing. The later edition of Aldrovandi (1610: 250, pl. 6) mentioned *Falco albus*, too.

***Francolinus Rüppellii* G. R. Gray, 1844**: 33 [by indication: ICZN 1999; article 12.2; misidentification]
= *Francolinus rüppelli* Finsch, 1870: 292–293: 126 [junior homonym]
= *Francolinus sharpii* Ogilvie-Grant, 1892: 47(–48)
= *Francolinus clappertoni sharpii* Ogilvie-Grant, 1892

According to Hall (1963), Rüppell would have met nominate *Francolinus Clappertoni* Children, 1826[15] (*locus typicus*: Bornu *fide* Ogilvie-Grant 1892) while travelling the Kordofan north of El Obeid. Later, when exploring the Dar Nuba Mountains south of El Obeid, Rüppell crossed into the contact zone of *gedgii* Ogilvie-Grant, 1891 (*locus typicus*: Plains near Mt. Elgon). On Rüppell's route from Massawa to the province of Simen and further south to Lake Tana, he had the opportunity to collect *sharpii* Ogilvie-Grant, 1892 (*locus typicus*: Bogosland, Abyssinia and Shoa: Begiuc region, see below). Rüppell's collector Martin Bretzka might also have obtained this subspecies in the province of Shoa. Slightly west of Gondar this latter subspecies intergrades with *königseggi* Madarász, 1914[16] (*locus typicus*: Dinder River *fide* Peters 1934). The type locality of *koenigseggi* is *c*.280 kilometres to the west of Gondar, and thus it is quite likely that Rüppell also met *koenigseggi*. Peters (1934) considered *koenigseggi* a synonym of *sharpii*, but this paper follows Hall (1963) in bringing *koenigseggi* out of synonymy and recognising it as a valid subspecies, distinguished by the whitish, not pale, horn margins (Smithe 1975) and the shape of the V pattern of the breast feathers (which is less pointed in *sharpii* and more pointed in *koenigseggi* than shown in Hall 1963: 118, no. 11). No material of *Francolinus c. testis* Neumann 1928 (*locus typicus*: Upper reaches of the Omo River) has been studied for this paper, but Hall (1963) put *testis* in synonymy of *sharpii*, Dickinson (2003) in synonymy of *nigrosquamatus* Neumann, 1902.

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[15] The Code (ICZN 1999; article 28) demands that any species-group name is always to begin with a lower case initial letter, regardless of how they were originally published. Therefore, from here on this paper refers to this taxon as *Francolinus clappertoni clappertoni* Children, 1826. Apparently J. G. Children *and* N. A. Vigors compiled the zoology appendix no. XXI in Denham *et al.* 1826 (E. C. Dickinson pers. comm. 2004 drew my attention to Vigors *et al.* 1827: '*The remainder* [*of the specimens surviving transport*] *have* [*sic*] *been rendered available to science by Mr Children and Mr Vigors, to whom we are indebted for the Zoological Appendix now under consideration, in which thirty-nine species of mammiferous quadrupeds, birds, and reptiles, are noticed*.' [*contra* Peters 1934 and Dickinson 2003]). The paper still uses the citation as in Peters (1934).

[16] The Code (ICZN 1999; article 32.5.2.1) demands deletion of German 'Umlauts'; from now on the taxon is referred to as *Francolinus clappertoni koenigseggi* Madarász, 1914.

We do know that Rüppell indeed collected *Francolinus clappertoni clappertoni* Children, 1826, because one of Rüppell's birds of this subspecies was illustrated in Cretzschmar's atlas (1827: pl. 9). Furthermore, two of Rüppell's specimens at Frankfurt Museum (SMF 12712, SMF 23955) originate from the Kordofan and are nominate *clappertoni*, and are probably the birds Cretzschmar saw and illustrated in his work.

However, Rüppell specimen BMNH 1843.2.8.30 (ex. coll. Leadbeater) is from the population of *F. c. sharpii* Ogilvie-Grant, 1892, although certain characters are shared with *F. c. nigrosquamatus* Neumann, 1902, and *F. c. koenigseggi* Madarász, 1914. This BMNH specimen has the entire crown sepia (no. 119, Smithe 1975), leaving only the nape natal brown. Fronto-dorsal and ventral feathers have a buff (no. 124) to pale horn (no. 92) margin combined with dark sepia close to the feather shafts (best seen on the mantle and the breast). The latter feature is actually addressed in the Latin *nigrosquamatus*, meaning 'blackish scaled' (Neumann 1902), but is most apparent in *koenigseggi*. Feather shafts are the same dark colour as the web, except for the paler shafts of the wing-coverts. The Rüppell BMNH specimen differs from most specimens of *F. c. sharpii* in having laterally broad, white feather margins. Caudal dorsal feathers also lack any dark sepia. Additionally, primaries 2–3 (counted from the outside) show an inner web, which is vertically striped cinnamon-drab to pale pinkish buff (219c and 121d). These features are also known from *nigrosquamatus* (the type specimen of which does not possess this character!). Most other subspecies show a horizontal pattern along the shafts; though among *sharpii* and, rarely, *koenigseggi* both patterns or a mixture can occur. The conclusion is that the BMNH specimen of Rüppell derives from Martin Bretzka's collecting along the shores of Lake Tana, where some integration of the subspecies *Francolinus c. sharpii* Ogilvie-Grant, 1892, *Francolinus c. nigrosquamatus* Neumann, 1902, and *Francolinus c. koenigseggi* Madarász, 1914, is assumed to occur. Actually, *F. c. testis* Neumann, 1928, from the upper reaches of the Omo River, might also refer to this interbreeding population.[17]

Generally one can state that the subspecies complex of *sharpii*, *koenigseggi* and *nigrosquamatus* exhibits clinal variation, from pale birds along the Red Sea coast to darker birds from the montane valleys of southern Ethiopia, which is best seen in crown colour.

G. R. Gray[18] (1844) was the first to note differences between nominate *Francolinus clappertoni* and Rüppell's Abyssinian birds on the basis of specimen

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[17] Two female specimens of Oscar Neumann from Lake Znaï, now at the American Museum of Natural History (AMNH 541340, 541341), show similar intermediate characters, as does a male specimen from 20 miles north of Lake Tana (alt. 7000 ft.), collected by R. E. Cheesman on 18 Oct. 1926 (AMNH 260562).

[18] George Robert Gray (1808–72).

BMNH 1843.2.8.30 (and a second bird, subsequently lost).[19] He named the new, apparently undescribed taxon *Francolinus Rüppellii* G. R. Gray, 1844: 33,[20] or Ruppell's Francolin, from Abyssinia. However, he failed to provide a proper species description. Instead, Gray plainly referred to Cretzschmar's plate, believing naively that all Rüppell specimens of this francolin group would have looked the same as those in front of him (indication; cf. ICZN 1999; article 12.2). But Cretzschmar (1827: pl. 9; *nec* 1826 *apud* Ogilvie-Grant, 1892) had studied nominate specimens from the Kordofan[21] before writing on the species, using for them Children's (1826) name *clappertoni*.[22] Gray (1844), when separating *Francolinus rueppelli* as a new species from *Francolinus clappertoni* Children, 1826, therefore erroneously referred to '*Perdix Clappertoni, Rüpp.* [*sic: Cretzschmar*] *Atl. Zool. t. 9*,' whilst in fact Cretzschmar's use of *Francolinus clappertoni* [*sensu stricto*] was correctly labelled as *Francolinus clappertoni* Children, 1826. What Gray saw was that the holotype of Children, housed in the BMNH,[23] differed considerably from Rüppell's specimen(s) and his valid, if mistaken, name *rueppelli*,[24] which is a junior synonym of *clappertoni*, was in fact based on a mixed type series consisting of Cretzschmar's plate and the BMNH Rüppell specimen(s) now being addressed by Gray (1844). The name *rueppelli* Gray, 1844, renders any younger homonym unavailable for the new taxon (ICZN 1999; article 49).[25]

In fact, Rüppell (1835: 11) mentioned that he had subsequently met this form of *Francolinus* in a different habitat during his second collecting trip to Abyssinia.

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[19] Specimen BMNH 1837.6.10.701 (Vell. Cat. XXXV. 123a), occurring in the same list associated with Leiden Museum, has proved to derive from the Senckenberg Museum, as shown in a later publication of G. R. Gray (1867: 51). This second specimen, last referred to by Ogilvie-Grant (1893: 165, sp. i), must be considered subsequently lost.

[20] According to the Code the correct spelling of the name would be *rueppelli,* genitive of 'Rüppellus' *nec* 'Rüppellius' (ICZN 1999; article 31.1.2.) and dissolved German Umlaut 'ü' to 'ue' (ICZN 1999; article 32.5.2.1.). This paper refers to Gray's name from now on as *Francolinus rueppelli.*

[21] Cretzschmar (1827) reported that Rüppell had collected six specimens of the taxon during his travels in the Kordofan region.

[22] Cretzschmar (1827) did not quote Children as author of *Francolinus clappertoni*, but referred to the travels of Denham & Clapperton.

[23] G. R. Gray (1846) illustrated the type specimen of *Francolinus clappertoni clappertoni* Children, 1826.

[24] Hugh Clapperton (1788–1827), the collector of Children's type, had never entered the habitat of any other population of the species than that of the nominate race (Denham *et al.* 1826).

[25] Finsch (1870: 292–293) and Blanford (1870: 46, 425) both properly and correctly described the taxon as *Francolinus rueppelli*, each producing a junior homonym of Gray's name. The Code (ICZN 1999; article 49) prevents the usage of *rueppelli* even though it was originally wrongly applied. Murs & Prévost (1847: 147) already referred to the name *Fr. ruppellii* [*sic*] in a descriptive way, but did not take any decision whether to except Gray's name or not. The authors referred their specimen(s) to Rüppell (*i.e.* Cretzschmar 1827: pl. 9), as nominate *clappertoni*, although these specimen(s) almost certainly would have derived from a different subspecies. Original text as follows: *Se trouve sur les collines, mais dans des localités fort peu élevées au-dessus du plateau Rouge où elle est assez commune; mais manque*

Gray's *Francolinus rueppelli*, as shown above, derived from this second batch. Because of the mistake made by Gray (1844) the historical synonymy is extremely confused until 1893. Different authors used *Francolinus rueppelli* in various spellings alternately for *Francolinus c. clappertoni*, *F. c. sharpii* or *F. c. gedgii* (*i.a.* G. R. Gray 1846, vol. 3: *Francolinus* no. 12, Rüppell 1845: 106, Murs & Prévost 1847: 147, Bonaparte 1856: 882, Heuglin 1856: 303, Heuglin 1861a: 197, A. E. Brehm 1863: 223, Heuglin 1863: 164, Antinori 1864: 94, Hartmann 1865: 69, G. R. Gray 1867: 51, Blanford 1868: 284, Finsch 1870: 292–293, Blanford 1870: 46, 425, G. R. Gray 1870: 265, no. 9664, Heuglin 1873: 886–890, Ogilvie-Grant 1891: 126, and Hartert 1891: 194, no. 2930). Reichenbach (1848–51: pl. 201, no. 1759), sometimes quoted in connection with *Francolinus rueppelli*, merely copied Cretzschmar's plate. Many authors have been confused on the taxonomy of the group. Heuglin (1873: 886–890), for example, synonymised Cretzschmar's use of *Perdix Clappertoni* with the name *Francolinus rueppelli*, referring to Finsch, Blanford and Brehm, but not to Gray, whom he cited for what is now considered the nominate race, not appreciating that Cretzschmar had in fact a specimen from the Kordofan in front of him when describing the bird. Unsurprisingly, confusion over the different subspecies of *Francolinus clappertoni* from the Ethiopian highlands and Sudan border region reappears even today (Gajdács & Keve 1968). Some modern authors simply do not recognise any subspecies in the group (Clements 2000).[26]

Ogilvie-Grant (1892: 47–48),[27] appreciating that Cretzschmar's pl. 9 was what Children described, consequently and correctly placed *Francolinus rueppelli* in synonymy, giving the apparently still nameless taxon the new name *Francolinus sharpii* on the basis of 12 specimens,[28] including BMNH 1843.2.8.30.[29] The name *Francolinus sharpii* thus appeared in the *Catalogue of the birds in the British Museum* (Ogilvie-Grant 1893: 165) and has been in common use since (Neumann

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Bornou, où elle avait été trouvée par le capitaine Clapperton, à qui il l'a dédiée. Le savant M. G. R. Gray a cru trouver une difference assez notable entre l'individu de Clapperton, décrit par Children, et celui du naturaliste allemand, pour en faire un espécification distincte. Ainsi de celui de Denham et de Clapperton il a fait Francolinus Clappertonii [*sic*], *et de l'individu de M. Ruppell que nous figurons: Fr. Ruppellii. Comme, la seule différence que nous apercevions entre la figure donnée par M. G. R. Gray et la nôtre, reside dans une fine moustache noire à l'ouverture du bec, et que nous ne connaissons pas l'oiseau d'après lequel a été fait son dessin, nous nous sommes bornés à la dénomination de M. Ruppell, sans rien préjuger de la question, dont un des éléments de solution nous manque.* Publication has been dated according to Sherborn & Woodward (1901).

[26] See Urban & Brown (1971: 38) for distribution and abundance of the subspecies *F. c. sharpii* and *nigrosquamatus*, and Cave & Macdonald (1955: 112–113) for the subspecies *F. c. clappertoni*, *cavei*, *gedgii*, *heuglini* and *koenigseggi*.

[27] William Robert Ogilvie-Grant (1863–1924).

[28] Warren (1966) still accounted for 12 specimens, but one apparently has gone missing since then.

[29] Other specimens were from the collections of William Thomas Blanford, William Jesse and Sir William Cornwallis Harris.

1904: 355, Sclater 1924: 86, Peters 1934: 79, Cheesman & Sclater 1935: 188, Moltoni 1937a: 76, Mackworth-Praed & Grant 1957: 247, Smith 1957: 20, Toschi 1959: 331, Hall 1963: 107–204, White 1965: 81, Urban & Brown 1971: 38, Wolters 1976: 105, Johnsgard 1988: 153, Howard & Moore 1991: 49, McGowan 1994: 498, Madge & McGowan 2002: 212, Dickinson 2003: 52). This paper follows in applying *Francolinus clappertoni sharpii* Ogilvie-Grant, 1892, to birds from central and northern Eritrea and northern and central Ethiopia south to the northern shores of Lake Tana.

Although the BMNH Rüppell specimen is part of the original type series of *Francolinus sharpii* Ogilvie-Grant, 1892, it shows some characters of closely related subspecies (see above).[30] Thus, a lectotype of *Francolinus clappertoni sharpii* Ogilvie-Grant, 1892 is designated to prevent any further confusion due to the mixed composition of the former series of syntypes. The specimen selected in Warren (1966: 269; although accidentally given the wrong registration no. BMNH 1869.10.17.394) and Ogilvie-Grant (1893: 165 sp.b) is hereby designated as:[31]

Lectotype of *Francolinus clappertoni sharpii* Ogilvie-Grant, 1892: BMNH 1869.10.16.394 [originally erroneously registered as 1869.10.17.394]. Male; loc.: [?] Bedjuk [= Begiuc region, *c*.15°25'N, 38°40'E; Warren (1966): Bedyuk, Finsch (1870): Bejook], Anseba-Valley, northern Ethiopia, 4200 ft.; date: 15 July 1867; leg.: William Thomas Blanford No. 1239; pres. by the Governor of India (Warren 1966; cf. Blanford 1870 for more details on the trip).

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[30] Studied material: BMNH: 32 specimens of *Francolinus c. clappertoni* Children, 1826 (incl. holotype); 26 specimens of *F. c. sharpii* Ogilvie-Grant, 1892a (incl. lecto- and ten paralectotypes); 14 specimens of *F. c. gedgii* Ogilvie-Grant, 1891 (incl. holotype); 18 specimens of *F. c. heuglini* Neumann, 1907; two specimens of *F. c. nigrosquamatus* Neumann, 1902; two specimens of *F. c. koenigseggi* Madarász, 1914; five specimens *F. c. cavei* Macdonald, 1940 (incl. holotype). ZMB: six specimens of *F. c. sharpii*, holotype of *F. c. tschadensis* Reichenow, 1919 (see below for comments on this taxon). SMF: eight specimens of *F. c. clappertoni* (SMF 12712, 23938–23943, 23955), four specimens of *F. c. sharpii* Ogilvie-Grant, 1892a (SMF 11574–11576, 23948). AMNH: 16 specimens of *F. c. clappertoni* Children, 1826 (several of a pale rufescent brown colour; AMNH 541305 with aberrant pattern); 15 specimens of *F. c. sharpii* Ogilvie-Grant, 1892a (18 specimens of mixed characters from southern Ethiopia were not used); six specimens of *F. c. heuglini* Neumann, 1907; holotype of *F. c. nigrosquamatus* Neumann, 1902. Not studied: types of *F. c. testis* Neumann, 1928 and *F. c. heuglini* Neumann, 1907. Following specimens were consulted to establish a hybrid status of specimen BMNH 1843.2.8.30: *nigrosquamatus* BMNH 1912.10.15.1 [loc.: *c*.150 miles west of Lake Zwai, Caroho, Bunno, southern Abyssinia], BMNH 1912.10.15.4 [loc.: 180 miles west of Lake Zwai, Limmu, Urguessa River, southern Abyssinia]; *koenigseggi* BMNH 1915.12.24.209–212, 214 and 1901.12.4.1 [loc.: Roseires and Disa in the valley of the Blue Nile]; *sharpii* BMNH 1927.11.5.14, 1880.1.1.1145, 1912.10.15.2–3 [loc.: Gondar, Shoa and Hawash River]; outgroup *sharpii* BMNH 1889.5.13.369, 1891.5.1.10 [loc.: Bogos region along the River Anseba]; '*testis*'? AMNH 541340–541341 [females, loc.: Lake Zwai, southern Ethiopia,], AMNH 260562 [male, loc.: 20 miles north of Gondar]; *nigrosquamatus* AMNH 541343 [holotype, female, loc.: Ford between Alesa Malo and Koscha on Middle Omo River, southern Ethiopia, 21Nov. 1901, leg. O. Neumann].

[31] The wording complies with the Declaration 60, *Bull. Zool. Nomen.* 2003: 263.

Paralectotypes: consequently, the Rüppell specimen BMNH 1843.2.8.30 (Ogilvie-Grant 1893: 165 sp. k) is only a paralectotype (with lesser taxonomic validity). Additional paralectotypes are BMNH 1889.5.13.363 (Ogilvie-Grant 1893: 165 sp. a), 1869.10.16.393 [originally 1869.10.17.393 on label] (sp. c), 1889.5.13.369 (sp. d), 1879.4.5.1609 (sp. e), 1879.4.5.1608 (sp. f), 1891.5.1.10 [originally 1891.5.1.11 on label] (sp. g), 1891.5.1.9 [originally 1891.5.1.10 on label] (sp. h), 1880.1.1.1144 (sp. l) and 1880.1.1.1145 (sp. m). The paralectotype BMNH 1837.6.10.701 (Ogilvie-Grant 1893: 165, sp. i), deriving from the collection of the Senckenberg Museum and collected by E. Rüppell in Abyssinia, was not found in 2002.

***Francolinus clappertoni tschadensis* Reichenow, 1919**: 334
= *Francolinus clappertoni clappertoni* Children, 1826 *apud* Peters 1934: 79
= *Francolinus clappertoni clappertoni* x *icterorhynchus fide* Neumann *quot.* Peters 1934: 79
= *Francolinus clappertoni* ? *tschadensis* Reichenow, 1919

During my studies on North African francolins the type of *Francolinus clappertoni tschadensis* Reichenow, 1919: 334, was also consulted, revealing some inconsistencies in the literature. The holotype and unique specimen shows remarkable darker feathers all over the ventral side, not featured in any of the nominate specimens at BMNH (including the nominate's type), SMF, ZMB and AMNH. Neumann (quoted in Peters 1934) suggested a hybrid between *F. clappertoni* and *dybowskii* [*i.e. F. icterorhynchus apud* McGowan 1994],[32] and Hall (1963) suggested an aberrant specimen. A more cautious view appears necessary, as little collecting has taken place further north of Lake Chad, from where the specimen originates, leaving open the possibility of a separate population isolated in semi-arid dry grasslands between swamp on one side and deserts on the other (cf. also the distribution of *F. clappertoni* in Bannerman 1953). None of the BMNH specimens derives from the north and north-east shores of the lake. Furthermore, comparing the breast feather pattern, it seems unlikely that the specimen is a hybrid of the two forms suggested. The crown of Reichenow's type is halfway dark sepia becoming hair brown towards the nape. The mantle feathers have buff margins, which are consistently narrower than 2 mm (in nominate *clappertoni* often broader). Feathers on the breast and belly are margined (2–3 mm) with orange-buff (nominate *clappertoni* broadly [often wider than 3 mm] in pale buff). Towards the belly the centres of these feathers show heart-shaped dark sepia. The same feathers in the nominate form posses an elongate lanceolated wedge as pattern. The holotype, ZMB 50.133, was collected by

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[32] McGowan (1994) submerged *dybowski* as an example of clinal variation, thus making *F. icterorhynchus* monotypic.

Haberer[33] in Noêem [or Ngeem], Tschad, on 20 November 1910, and was considered by him to be a female (despite a long spur).

'Weisser Papagei mit rothen Flügeln' [White parrot with red wings] Rüppell, 1838: 399
= *Psittacus levaillantii* (Kuhl)? *apud* Rüppell, 1837a: 63
= *Pionus Vaillantii*? Kuhl *apud* Rüppell, 1845: 94
= *Poicephalus* [*robustus*] *ssp.* [?]

For the sake of completeness I present some information on this dubious species, to which Michael Walters (BMNH) first drew my attention. Rüppell always based his descriptions and notes on real specimens, which he procured for all except one of the new species he described. However, this one parrot he only observed, describing it as follows (Rüppell 1838: 399): *Namentlich erwähne ich aber, als von uns hier wahrgenommen, einen Schwarm weisser Papageien mit rothen Flügeln, die wir sonst in keiner Gegend Abyssiniens wieder fanden, und deren Aufenthalt in einer so hohen Gebirgsregion merkwürdig ist. Diese Thiere—höchst wahrscheinlich der von Kuhl beschriebene Psittacus Levaillantii—schienen unsere feindlichen Absichten errathen zu haben, und ermüdeten, indem sie bald auf das eine, bald auf das andere Ufer des nur einzelne von einander weit entfernte Furthen habenden Stromes flogen, die Geduld meiner sie vergebens verfolgenden Jäger.* [Namely I mention a flock of white parrots with red wings observed by us, but not seen in any other region of Abyssinia; and its occurrence in the high mountains seemed odd. These birds—most likely *Psittacus Levaillantii* described by Kuhl—probably guessed our hostile intentions, and tired the hunters, which tried to follow them, by flying from one shore of the river, with fords far apart, to the other]. This description was reviewed by Finsch (1868: 931), who wrote: *Ein weisser Papagei mit rothen Flügeln würde für Afrika, wie überhaupt, unbedingt neu sein, denn an eine Gleichartigkeit mit Ps. Levaillantii, Kuhl (robustus, Gmelin) ist nicht zu denken.* [A white parrot with red wings would definitely be for Africa, as for any region, new, as for an equal identity to *Ps. Levaillantii*, Kuhl (*robustus*, Gmelin) is not to imagine]. However, Finsch, like Rüppell, correctly hesitated to name the bird.

Rüppell's observation occurred on 29 June 1832 near Donkoski in the Selki Mountains (*c.*4,000 m) in the province of Simen. One should probably not rule out the existence of a more whitish subspecies of *Poicephalus robustus*, extending the greyish white of the head and breast onto the belly and upperwing-coverts. The red of the shoulders might have extended to the underwing-coverts as well (cf. Juniper & Parr 1998: 376–377). Rüppell never exaggerated in any of his descriptions and observations, and was always absolutely exact in his notes, so that one may assume that he did see a small parrot, of which the identity must remain unknown. The form might have been already very rare during Rüppell's visit, and by now extinct, due to intensive hunting and the grazing of domesticated animals. Still, it seems strange that no other traveller, especially Theodor von Heuglin, met the 'white parrot with red wings.' Rüppell's (1845) reference to 'Le Vaillant Taf. 130' does not refer to Levaillant (1799, 1802, 1805, 1806, 1808), but to Kuhl's (1820) table on p. 104: no. 130.

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[33] Karl Albert Haberer (1864–1941)

***Buceros cristatus* Rüppell, 1835**: 3, pl. 1 *nec Buceros cristatus* Vieillot, 1816
= ? *Buceros coronatus* Rüppell MS
= *Bycanistes brevis omissus* Peters, 1945 *nomen novum*

Peters (1945), recognising the preoccupation of Rüppell's name by *Buceros cristatus* Vieillot, 1816,[34] created a *nomen novum* for this taxon (footnote). The lectotype (SMF 12621, collection date 1832 *fide* Steinbacher 1949) and the single paralectotype (SMF 16818, collection date 1833) of Rüppell's name are also types of the *nomen novum* of Peters. Five additional 'Rüppell' specimens are in the Frankfurt (Hartert 1891: 141, sp. 2144a), Berlin (ZMB 9673) and Leiden museums (RMNH cat. nos. 1–3). None of these latter birds can be considered as having type status, as Rüppell (1835) explicitly referred only to one collected pair. Frankfurt's lectotype, with its acquisition date of 1834, was certainly at Rüppell's disposal when writing the species account. The paralectotype even has an original field label attached stating »*v. Rüppell / No. 354 / fömina / d. 15 März / 1833*«. The additional specimens were obtained from the province of Shoa and were collected by Martin Bretzka in 1833–42. Rüppell wrote concerning these acquisitions in a letter to Maria Emma Gray, the wife of John Edward Gray (1800–75), on 17 February 1842 (BMNH archives: DF200/145/10): [...] *there are for sale here a beautifull* [*sic*] *pair ♂ & ♀ of my Buceros cristatus, a species, of which up to this day there was only in Europe the single couple, I brought home from the south of Abyssinia. A servant of mine I had left in that country sex* [*six*] *years ago, has just sent to me some* [...] *couples of these beautifull* [*sic*] *birds.* [...] *One pair of the Buceros Temminck has paid for the Leyden Museum with 126 florins or 275 francs.*

***Pogonias undatus* Rüppell, 1837a**: 52, pl. 20
= *Lybius undatus undatus* (Rüppell, 1837a) & *Lybius undatus thiogaster* Neumann, 1903

Rüppell (1837a) described the juveniles of his new taxon as having the nape, necksides and throat black with whitish spots; the forehead, however, vivid vermilion-red like in the adult. These characters, however, refer better to adults of the subspecies *L. u. thiogaster* Neumann, 1903. Any bird of this species with fully developed red on the forehead is believed to be adult (Neumann 1903). Steinbacher (1949) already designated a lectotype (SMF 12616) resembling *L. u. undatus* (Rüppell, 1837a). Paralectotypes SMF 30317–30320 and RMNH cat. no. 1 are nominate *undatus*; however, paralectotype BMNH 1837.6.10.706 is a bird with intermediate characters of *L. u. undatus* (Rüppell, 1837a) and *L. u. thiogaster* Neumann, 1903, and might be the specimen Rüppell described as 'juvenile.' So far, no true *L. u. thiogaster* Neumann, 1903, of Rüppell's collection has been discovered.

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[34] Vieillot (1816: 591): Le Calao à Casque concave, *Buceros cristatus* from Batavia [in error for Sumatra], today's *Buceros bicornis* Linnaeus, 1758.

***Alauda ruficeps* Rüppell, 1840**: 102, pl. 38, fig. 1; *nec Alauda ruficeps* Bechstein, 1795: 120
= *Calandrella cinerea erlangeri* (Neumann, 1906)

Rüppell's name *ruficeps* is pre-occupied by Bechstein's 'Feldlerche mit rothbraunem Kopfe *Alauda arvensis ruficeps*' [Skylark with a red-brown head] (Bechstein 1795: 120, cf. Peters 1960; not mentioned in Mey 2003).

***Saxicola isabellina* Temminck, 1829a**: livr. 79, pl. 472, fig. 1 [incl. females of *Oenanthe deserti deserti*]
= *Saxicola isabellina* Cretzschmar, 1830: 52, pl. 34, fig. b
= *Saxicola isabellina* Rüppell MS [in error incl. one female of *Oenanthe deserti deserti ante* 1826]
= *Saxicola olivastra* Rüppell MS [inter 1822–30, on labels of specimens at RMNH and NMW]
= *Saxicola saltator* Ménétriés, 1832: 30[35]
= *Saxicola isabellina* Rüppell, 1837a: 80, 1845: 58 [incl. *Oenanthe bottae frenata* (Heuglin, 1869a)]
= *Oenanthe isabellina* (Temminck, 1829a)[36]

***Saxicola albogularis / albigularis* Rüppell MS** [*ante* 1837][37]
= *Saxicola isabellina* (Rüpp.) *apud* Rüppell, 1837a: 80, 1845: 58 [*ex parte*, incl. *Oenanthe isabellina*]
= *Saxicola frenata* Heuglin, 1869a: 158 (–159)
= *Oenanthe bottae frenata* (Heuglin, 1869a)

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[35] The following characters, besides the general colour, mentioned by Ménétriés (1832), doubtlessly refer to *Oenanthe isabellina* (Temminck, 1829a): *la moitié supérieure de la queue est blanche, et le reste d'un noir profound* and *les deux sexes sont semblables*.

[36] The older name for *Oenanthe isabellina*, *Motacilla strapazina* Pallas, 1811: 447, is preoccupied by *Motacilla strapazina* Gmelin, 1788 (*fide* Seebohm 1881).

[37] This MS name is quoted on old BMNH labels and in the BMNH Vellum Catalogue. The MS name well describes the throat pattern of *Oenanthe bottae frenata*.

Saxicola deserti **Temminck, 1825**: livr. 60, pl. 359, fig. 2
= *Saxicola isabellina* Rüppell MS [*ex parte* in error for one female of *Oenanthe deserti deserti ante* 1826]
= *Saxicola pallida* Rüppell MS [*pro parte* females of *Saxicola deserti* Temminck, 1825][38]
= *Saxicola deserti* Rüppell MS [*pro parte* males of *Saxicola deserti* Temminck, 1825][39]
= *Saxicola isabellina* Temminck, 1829a: livr. 79, pl. 472, fig. 1 [*pro parte*: females] *nec Saxicola isabellina* Cretzschmar, 1830: 52, pl. 34
= *Saxicola deserti* Rüpp. Temm. *apud* Rüppell, 1845: 58
= *Oenanthe deserti deserti* (Temminck, 1825)

Rüppell collected *inter alia* the following three taxa of wheatears, *Oenanthe deserti deserti* (Temminck, 1825), *Oenanthe isabellina* (Temminck, 1829a) and *Oenanthe bottae frenata* (Heuglin, 1869a). He met the latter taxon only during his second collecting trip, whilst the first two taxa were described from material taken during his first collecting trip. Rüppell already labelled all specimens with MS names in the field. He frequently sent back specimens from Africa addressed to Cretzschmar at the museum of the Senckenberg Society. During Rüppell's absence and to Rüppell's great mischief, Cretzschmar began to publish descriptions for some of the new birds. Cretzschmar forwarded other specimens to Temminck at Leiden, who first received Rüppell material in 1823 (see Temminck 1823: livr. 41: *Alauda isabellina* and *Alauda bilopha*). Between them, Cretzschmar and Temminck described 43 new bird taxa based on Rüppell's collections, before Rüppell even returned from Africa.[40] In so doing, they nearly always used the names proposed by Rüppell without giving Rüppell the credit for them. Both, however, always referred to Rüppell in the main text as the collector of the specimens. These MS names also show up in Rüppell's letters, which he sent from Africa to various colleagues.

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[38] Two females of *Oenanthe deserti deserti* (Temminck, 1825) were labelled by Rüppell as *Saxicola pallida*: SMF 52635: loc. Nubia, leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Rüppell Senckenberg Museum Frankfurt am Main. Label data: *Saxicola pallida* Rüpp. / ? Rüpp. Zool. Atl. Vög. t. 34 / Nubien Geschenk von Dr Rüpp. 1825 [SMF label]. SMF 52634: loc. Nubia, leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Rüppell/Senckenberg Museum Frankfurt am Main. Label data: *Saxicola pallida* Rüppell / *Saxicola isabellina* Tem. Tem[minck's] pl[.] col. 472 / ♂ juv. / Nubien Geschenk von Dr Rüppell 1825 [SMF label].

[39] Male specimens of *Oenanthe deserti deserti* (Temminck, 1825) at Frankfurt Museum were labelled with Rüppell's MS name *Saxicola deserti* (*fide* labels on specimens SMF 52636–37). This name was used by Temminck in the description of the taxon. One of the males is a syntype of *Saxicola deserti* Temminck, 1825: SMF 52636: male, loc. Nubia, leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Rüppell/Senckenberg Museum Frankfurt am Main. Label data: *Saxicola deserti* Rüpp. / ♂ annotinus / Nubien Gesch. von Dr Rüpp. 1823 [SMF label]. The other male, SMF 52637: loc. Suez, leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Rüppell/Senckenberg Museum Frankfurt am Main. Label data: *Saxicola deserti* Rüpp. / wie hornotina [added:] Winterkleid / Suez Gesch. von Dr Rüpp. 1831 [SMF label]; has no type status.

[40] Not all these names are valid according to modern taxonomy.

Already in 1825 Temminck named a new wheatear *Saxicola deserti* based on a male collected by Rüppell, referring also to specimens at Frankfurt. A few years later Temminck described a further wheatear labelled by Rüppell *Saxicola isabellina*. Most of Rüppell's bird specimens labelled *Saxicola isabellina* stayed at Frankfurt. Only the smallest specimen of the series was forwarded to Temminck in Leiden by Cretzschmar. This very specimen though was in fact a female Desert Wheatear *Oenanthe deserti deserti* (Temminck, 1825). At that time (1829a) Temminck knew only the male of the species. Consequently, he described this bird, as he did with other Rüppell material, under Rüppell's MS name, in this case as *Saxicola isabellina* Temminck, 1829a: livr. 79, pl. 472, fig. 1.[41] Thus Temminck's description and plate of Isabelline Wheatear is actually based on a female Desert Wheatear. However, Temminck also referred to further specimens at Frankfurt Museum, making these specimens syntypes.[42] But the specimens at Frankfurt Museum labelled *Saxicola isabellina* Rüppell MS are in fact what modern taxonomy regards as *Oenanthe isabellina* (Temminck, 1829a). To add to the confusion, Temminck also received Rüppell specimens labelled *Saxicola olivastra*, in 1823.[43] Comments on the labels, which are said to be transcripts of Temminck's originals, reveal that Temminck did not work on them but kept these birds under Rüppell's MS name in his collection. Only a single specimen, RMNH 89369, was labelled by Temminck as '*S. isabellina* Temm. Pl. col. 472.1 ♂ voy. Rüpp. Nubie,' which is the female *Oenanthe deserti* as explained above. Cretzschmar (1830: 52, pl. 34, fig. b) followed Temminck's path and also described *Saxicola* specimens from Dongola as new for science. However, when using Rüppell's MS name *Saxicola isabellina*, Cretzschmar attributed this to the birds we still today refer to as *Oenanthe isabellina* (Temminck, 1829a). For many years *Oenanthe isabellina* was attributed to Cretzschmar, rather than to Temminck, mainly due to the incorrect belief that Cretzschmar published his description in 1826, rather than 1830. *Inter alia*, the following authors referred to *Oenanthe isabellina* Cretzschmar, 1826 [1830]: Rüppell 1845: 58 [*partim*], Horsfield & Moore 1854: 287, Antinori 1864: 39, Heuglin 1869a: 157–158, Seebohm 1881: 399, and Hartert 1910: 691. Rüppell (1837a: 80) correctly noted that Temminck's *isabellina* cannot be synonymised with Cretzschmar's *Saxicola isabellina*; but falsely synonymised it with *Saxicola pallida* Cretzschmar 1830: 51, which is a younger synonym of *Oenanthe monacha* (Temminck, 1825) (cf. Heuglin 1869a: 157, Seebohm 1881: 383, Steinbacher 1949: 111).[44]

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[41] Temminck (1829a: livr. 79): *Les couleurs du plumage offrent peu de variété; un ton isabelle plus ou moins pur forme la teinte des parties supérieures; un brun-isabelle couvre le méat auditif; la gorge, le ventre, l'abdomen et la moitié de la queue sont blanchâtres; la poitrine et le milieu du cou d'une isabelle très-claire; les ailes, d'un brun terne, ont les couvertures lisérées de brun clair; la plus grande moitié de toutes les pennes caudales d'un brun noirâtre; le bec brun, et les pieds noirs. Longueur, cinq pouces. Du voyage de M. Ruppel en Nubie. Musées des Pays-Bas et de Francfort.* Especially the description of the tail as being more than half blackish brown clearly refers to *Oenanthe deserti*.

[42] Temminck might have seen these Frankfurt specimens of *Oenanthe isabellina* on his visit to Frankfurt in 1824 (Lynden-de Bruïne 2001).

[43] RMNH holds three specimens (RMNH 89244–46) labelled by Temminck himself as '*S. olivastra*, Rüpp. Nubie per Rüppell.' These are true *Oenanthe isabellina* (Temminck, 1829a).

It was Sclater (1930: 455)[45] who first cited Temminck as the original author for *Oenanthe isabellina sensu* Cretzschmar, 1830, followed by, *inter alia*, Hartert & Steinbacher 1935: 312, Friedmann 1937: 136, Vaurie 1959: 350, White 1962: 105, Ripley 1964: 122, Wolters 1980: 422, Cramp *et al.* 1988: 756, Sibley & Monroe 1990: 542, and Dickinson 2003: 685.

As the mixed type series of *Saxicola isabellina* Temminck 1829a has caused several problems and even errors in the taxonomy of the Isabelline Wheatear I herewith designate, according to the Code (ICZN 1999, article 72.4 and 74.7.3, recommendation 74A, 74B) and after some formal discussions with the chair of the Standing Committee on Ornithological Nomenclature (Richard Schodde) and other colleagues (René Dekker, Edward Dickinson, Markus Moser), the specimen SMF 12693, illustrated in Cretzschmar 1830: 52, pl. 34, fig. b and listed as 'lectotypus' of Cretzschmar's *Saxicola isabellina* in Steinbacher (1949: 111)[46] and Hartert (1891: 5 sp. no. 40b) as:[47]

Lectotype of *Saxicola isabellina* Temminck, 1829a: livr. 79, pl. 472, fig. 1: SMF 12693: adult male; loc. Nubia [restricted to the province 'Dongola' in Steinbacher 1949]; northern Sudan; date: [September 1823–June 1824]; leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Rüppell/Senckenberg Museum Frankfurt am Main, SMF acqu. 1824 (cf. Rüppell 1829, Mertens 1949 for more details concerning the trip). Label data: *Saxicola isabellina* Rüppell / ? adult / Nubien Geschenk von Dr Rüppell 1824 [SMF label].

Known *paralectotypes* of *Saxicola isabellina* Temminck, 1829a:[48] SMF 46186: adult female; loc. [province of Dongola], Nubia, northern Sudan; date: [February 1823–August 1823]; leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Rüppell/Senckenberg Museum, Frankfurt am Main, SMF acqu. 1823 (cf. Hartert 1891: 111, no. 40a). Label data: *Saxicola isabellina* Rüpp[.] 1826 [error for 1830]

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[44] Cretzschmar's (1830: 51) description of the tail of *Saxicola pallida* as turning from isabelline to reddish brown with the exception of the two central feathers, which are matt brown, unambiguously refers to females and immatures of *Oenanthe monacha*.

[45] A footnote in Sclater (1930) amended the publication date of Cretzschmar's *Saxicola isabellina* correctly to 1830. However, Sclater failed to recognise that Temminck's description refers to a female of *Oenanthe deserti*.

[46] Steinbacher's (1949: 111) lectotype designation only refers to Cretzschmar's use of *Saxicola isabellina* and has no nomenclatural relevance on the actual designation.

[47] The wording complies with the Declaration 60, *Bull. Zool. Nomen*. 2003: 263; Recommendation 74G is followed.

[48] SMF 46185, listed in Hartert (1891: 5, no. 40), has no type status for Temminck's name; it may, however, qualify as a syntype of *Saxicola saltator* Ménétriés, 1832: 30.

/ Rüpp. Atlas ♀ Vög: taf. 24 [error for 34] / Nubien per Dr Rüppell 1823 [SMF label] [=*Oenanthe isabellina* Temminck, 1829a]. NMW 59269: indet. sex; loc. [province of Dongola], Nubia, northern Sudan; date: [February 1823–July 1825]; leg. Dr Wilhelm Peter Eduard Simon Rüppell; coll. Naturhistorisches Museum Wien, acqu. no. 1826.II.10 (not in Pelzeln & Lorenz 1887: 197–198). Label data: *Saxicola valida* Licht. / (*S. olivastra* Mus. Francof.) Vom Frankfurter Mus. in Tausch / Nubien [NMW label] [=*Oenanthe isabellina* Temminck, 1829a]. RMNH 89369: adult female; loc. Nubia, northern Sudan; date: [1823–1825]; leg. Dr Wilhelm Peter Eduard Simon Rüppell; ex.coll. Senckenberg Museum, Frankfurt am Main, coll. Nationaal Natuurhistorisch Museum, Leiden, acqu. 1824–1829 (cf. Dekker 2003: 43). Label data: *S. isabellina* Temm. pl. col. 472.1. ♂ voy. Rüpp. Nubie [=female of *Oenanthe deserti deserti* (Temminck, 1825)]. ?BMNH 1842.8.16.10: indet. sex; loc. Abyssinia [Nubia in Cretzschmar 1830], date: [not given], leg. Dr Wilhelm Peter Eduard Simon Rüppell, ex. coll. Senckenberg Museum, Frankfurt am Main, coll. The Natural History Museum, Tring, BMNH acqu. 1836 (cf. Seebohm 1881: 401, sp. b). Label data: Abyssinia ex. Rupp. [BMNH label] [=*Oenanthe isabellina* Temminck, 1829a]. ?BMNH [no modern registration] / Vell. Cat. XV. 434a: indet. sex; loc. Abyssinia [Nubia in Cretzschmar 1830]; date: [not given]; leg. Dr Wilhelm Peter Eduard Simon Rüppell, ex. colls. John Gould, Zool. Soc. Lond. & Senckenberg Museum, Frankfurt am Main, coll. The Natural History Museum, Tring, BMNH acqu. <1837 (cf. Seebohm 1881: 401, sp. a). Label data: loc. Abyssinia ex. coll. [not given] [BMNH skin label] [=*Oenanthe isabellina* Temminck, 1829a]. [RMNH 89244, 89245, 89246 are not part of the type series of *Saxicola isabellina* Temminck, 1829a].

Subsequently, in adding more details to Cretzschmar's description of *Oenanthe isabellina*, Rüppell (1837a: 80) included characters of both *Oenanthe bottae frenata* (Heuglin, 1869a) and *Oenanthe isabellina* (Temminck, 1829a) (cf. Heuglin 1869a: 157–158, Seebohm 1881: 401), even though Rüppell had previously distinguished *O. b. frenata* from *O. isabellina* as *Saxicola albo-/albigularis*, an unpublished MS name (quot. BMNH registers).[49,50] Whilst there is considerable evidence that Rüppell indeed collected *O. b. frenata* (Heuglin, 1869a),[51] no name other than

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[49] *Oenanthe bottae heuglini* (Finsch & Hartlaub, 1870), a subspecies Rüppell could also eventually have met, is much darker on its back than the *Saxicola isabellina* shown on Cretzschmar's plate, sufficiently so that Rüppell would have appreciated the difference. It may therefore be assumed that Rüppell did not collect this subspecies.

[50] Sibley & Monroe (1990) considered that *Oenanthe bottae* and *Oenanthe isabellina* might be conspecific.

[51] There are six specimens of *Oenanthe bottae frenata* (Heuglin, 1869a) at Frankfurt Museum originating from Rüppell's collecting in the province of Simen, Abyssinia, which were acquired by the museum in 1832 (SMF 46177–82). A seventh specimen, thought to be of the same provenance (Hartert 1891: 5, no. 44), is in fact from Theodor von Heuglin, and might qualify as a syntype of his name *Oenanthe bottae frenata* (SMF 46183). Two further Rüppell specimens of *O. b. frenata* are housed at BMNH (BMNH 1837.6.10.724, BMNH 1843.2.8.5).

O. isabellina is given for this taxon in Rüppell (1837a, 1845). On their labels Rüppell referred to these specimens as juveniles of *O. isabellina*. Therefore it is concluded that *Saxicola isabellina apud* Rüppell (1837a, 1845) must be recorded in the synonymy of both adult *O. isabellina* (Temminck, 1829a) and adult and immature *O. b. frenata* (Heuglin, 1869a: 157). Other scientists were also puzzled by these two different populations and merged the resident Abyssinian Red-breasted Wheatear with migrant Isabelline Wheatear into *O. isabellina* (Horsfield & Moore 1854: 287). Following Ripley (1964: 121–132), *O. isabellina* (Temminck, 1829a) is only a winter visitor to Nubia (i.e. Sudan), whilst *O. b. frenata* is resident in the Ethiopian highlands (cf. Heuglin 1869a: 158 recorded a breeding bird in the highlands of Simen on 28 February 1853).

Saxicola monacha **Rüppell** MS [*pro parte* adult males]
= *Saxicola monacha* 'Rupp.' Temminck, 1825: pl. 359, fig. 1 [*ex parte*]
= *Saxicola monacha* (Rüpp.) *apud* Rüppell, 1837a: 79 [*pro parte* adult males]
= *Oenanthe monacha* (Temminck, 1825) [*ex parte* adult male; and incl. *Oenanthe leucopyga leucopyga* (Chr. L. Brehm, 1855)]

Saxicola leucura **'(Lichtenstein)' Rüppell, 1837a**: 79 [*pro parte* females, first-winter plumage], *nec Saxicola leucura* Gmelin, 1789: 820
= *Saxicola cachinans* [*sic*] (Temm.) *apud* Rüppell, 1837a: 79 [alternatively applied]
= *Saxicola leucura* Gmelin *apud* Rüppell, 1845: 58 [*pro parte* females, first-winter plumage]
= *Oenanthe leucopyga leucopyga* (C. L. Brehm, 1855)] [*ex parte* females, first-winter plumage]

Saxicola pallida **Cretzschmar, 1830**: 51, pl. 34, fig. a [*pro parte* females, first-winter plumage]
= *Saxicola isabellina* Temminck pl. 472, fig. 1 *apud* Rüppell, 1837a: 79 [in error]
= *Saxicola pallida* Rüpp. *apud* Rüppell, 1845: 58 [*ex parte*]
= *Oenanthe monacha* (Temminck, 1825) [*ex parte* females, first-winter plumage]

The BMNH 1881.5.1.935 specimen, which has been identified as *Oenanthe leucopyga leucopyga* (C. L. Brehm, 1855) in first-winter plumage, originates from the collection of Leadbeater (via John Gould), and as such is probably also from Rüppell's collecting activities in North Africa (Nubia). However, Rüppell obviously did not recognise the taxon as new and probably included this species under a different and thus composite species name in his publications. The question thus arising is in which of the '*Saxicola*' species Rüppell (1837a, 1845) would have included *O. l. leucopyga* (C. L. Brehm, 1855), which was at the time of Rüppell's publications undescribed. We can assume that Rüppell certainly met this common bird during his collecting activities on the shores of the Nile around 'New' Dongola (northern Sudan). Keith *et al.* (1992) described the bird as being 'generally abundant in suitable habitat'.

There is now much evidence that Rüppell included the juvenile, first-winter and female of *O. l. leucopyga* (C. L. Brehm, 1855) under the name '*Saxicola leucura* (Lichtenstein)' and '*Saxicola cachin*[*n*]*ans* (Temm.)' in his publication of 1837 (Rüppell 1837a: 79). Temminck (1820: 236–237) linked the name *Saxicola cachinnans* to Latham's (1783: 49, pl. 38) White-tailed Thrush and *Turdus leucurus*, which are the basis for the valid name of nominate *Oenanthe leucura* (Gmelin, 1789: 820), the Black Wheatear (cf. Hemprich & Ehrenberg 1833: dd). Black Wheatears occur along the Mediterranean coast of southern Europe and north-west Africa. Only very rarely have vagrants of the subspecies *syenitica* been recorded in northern Egypt (Heuglin 1869a: 155–156). Lichtenstein's (1823: 32) '*Saxicola leucura n.–Turdus leucur. Lin. Gm.–Saxic. cachinnans Temm.*' from Egyptian Nubia, described as '*S. atra, cauda (Basi) alba Longot. 7", tarsi 14'''.*' is difficult to identify on the basis of its description (it could be either *O. l. leucopyga* [C. L. Brehm, 1855] or *O. l. syenitica* [Heuglin, 1869a]), but has been synonymised with *O. l. leucopyga* (C. L. Brehm, 1855) on the basis of its distribution and the identity of the type material collected by Hemprich and Ehrenberg (thus Lichtenstein's name is a junior homonym; cf. Seebohm 1881: 374). Hartert (1891: 5) listed two of Rüppell's specimens from Egypt as *O. leucura*, but mentioned characters that are not specific. In subsequently again publishing on *O. leucura*, Hartert (1910: 698–699) did not cite Egypt within its range.

Males of the African subspecies *O. l. syenitica* (Heuglin, 1869a) are not only very similar to first-winters and females, but are especially similar to juvenile *O. l. leucopyga* (C. L. Brehm, 1855). An exception is the colour of the head in females and immature males, which is black in *Oenanthe leucopyga*, but dark umber in *Oenanthe leucura*. Juveniles[52] of *O. leucopyga* are distinguished from *O. leucura* by the dark umber-brown to blackish belly, which is pale hair brown in *O. leucura* (cf. juveniles ZMB 4854, ZMB 70.246). No specimen of *O. leucura syenitica* (Heuglin, 1869a) from Rüppell's collection has been traced, so it is assumed that Rüppell never collected this taxon.

Furthermore, Rüppell included adult males of *O. l. leucopyga* (C. L. Brehm, 1855) alongside adult males of *O. monacha* (Temminck, 1825) under '*Saxicola monacha*, (Rüpp.)' in his publication of 1837 (Rüppell 1837a: 79). Already in the field Rüppell applied the MS name '*Saxicola monacha*' to both adult males of *O. l. leucopyga* (C. L. Brehm, 1855) and males of *O. monacha* (Temminck, 1825). Adult males of *O. monacha* differ from male *O. leucopyga* in having a white, not black belly (but both have prominent white undertail-coverts and vent). Loche (1867) was first to draw attention to the fact that Rüppell mixed *O. leucopyga* with *O. monacha* (Temminck, 1825).[53]

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[52] Juveniles of *Oenanthe leucopyga leucopyga* (Brehm, 1855) are identified as such in having pale feather tips on the head (and rarely the back). Tail feathers of immatures and juveniles are often smudged with a large brown spot near the tip, similar to *Oenanthe leucura*.

Females and first-winters of *Oenanthe monacha*, which were described by Cretzschmar (1830: 51, pl. 34, fig. a) as *Saxicola pallida* (cf. Hartert 1910: 701), were still erroneously referred to '*Saxicola pallida* (Rüpp.)' in Rüppell (1837a). Additionally Rüppell believed that Temminck's (1829a) description of female *Oenanthe deserti deserti* (Temminck, 1825) as *Saxicola isabellina* (see above) would also be *Saxicola pallida*.

O. monacha (Temminck, 1825) and *O. l. leucopyga* (C. L. Brehm, 1855) occur sympatrically in the Nile Delta. The main breeding habitat of *O. monacha*, though, is east of the Nile to the west shore of the Red Sea, whilst *O. leucopyga* replaces *O. monacha* from the Sudanese border south. *O. deserti* is a winter migrant to north-east Africa from Asia (cf. Ripley 1964, Keith *et al.* 1992).

In summary, Rüppell's use of *Saxicola monacha* must be synonymised with males of *O. l. leucopyga* (C. L. Brehm, 1855) and *O. monacha* (Temminck, 1825), whereas Rüppell's *Saxicola leucura* with females and first-winters of *O. l. leucopyga* (C. L. Brehm, 1855). *Saxicola pallida apud* Rüppell (1837a, 1845) are the first-winter and female of *O. monacha* (Temminck, 1825), although once also confused with females of *O. deserti* (Rüppell 1837a: reference to Temminck 1829a).

List of synonymy for Rüppell's (1845) genus *Saxicola*[54]

Saxicola leucura, Gmelin, *apud* Rüppell, 1845 = *Oenanthe leucopyga leucopyga* (C. L. Brehm, 1855: 225): females, first-winters and juveniles.
Saxicola monacha, Rüpp. Temm., *apud* Rüppell, 1845 = *Oenanthe leucopyga leucopyga* (C. L. Brehm, 1855: 225): adult male, and *Oenanthe monacha* (Temminck, 1825: pl. 359, fig. 1): adult male.
Saxicola lugubris, Rüpp., *apud* Rüppell, 1845 = *Oenanthe lugens lugubris* (Rüppell, 1837a: 77, pl. 28, fig.1): immature, female and male.
Saxicola melaena, Rüpp., *apud* Rüppell, 1845 = *Saxicola melas* Rüppell, 1837a: pl. 28, fig. 2 = *Myrmecocichla melaena* (Rüppell, 1837a: 77): adult and immature (Keith *et al.* 1992: no immature known [in error]).
Saxicola albifrons, Rüpp., *apud* Rüppell, 1845 = *Myrmecocichla albifrons albifrons* (Rüppell, 1837a: 78; Rüppell, 1845: pl. 17): adult / immature (Rüppell 1837a: females [in error]).

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[53] Loche (1867), though, wrongly cited Rüppell's plate 34 (*i.e.* Cretzschmar 1830, pl. 34, fig. a), which would demonstrate that females of *Oenanthe monacha* had been re-described under the name *pallida*, but would not underline Loche's case that *O. monacha* in Rüppell (1837) includes *O. leucopyga*.

[54] Names and citations follow Ripley (1964). Names and their synonyms from Rüppell (1837a) are added in all cases where these differ from Rüppell (1845).

Saxicola lugens, Lichtenstein, *apud* Rüppell, 1845 = *Oenanthe lugens lugens* (Lichtenstein, 1823: 33): adult male (perhaps also females and other subspecies included).

Saxicola albofasciata, Rüpp., *apud* Rüppell, 1845 = *Saxicola torquatus albofasciatus* Rüppell, 1840: 115; Rüppell, 1845: 39, pl. 16: first-year male (cf. David & Gosselin 2002b: 263).

Saxicola melanura, Rüpp. Temm., *apud* Rüppell, 1845 = *Cercomela melanura lypura* (Hemprich & Ehrenberg, 1833: 'ee'): adult and (?) *Cercomela melanura melanura* (Temminck, 1824a: pl. 257): adult.

Saxicola isabellina, Rüpp., *apud* Rüppell, 1845 = *Oenanthe isabellina* (Temminck, 1829a: livr. 79, pl. 472, fig. 1): adult, and *Oenanthe bottae frenata* (Heuglin, 1869a: 157): adult, immature and (?) juvenile.

Saxicola pallida, (Rüpp.), *apud* Rüppell, 1837a = *Oenanthe deserti deserti* (Temminck, 1825: pl. 359, fig. 2): female, and *Oenanthe monacha* (Temminck, 1825: pl. 359, fig. 1): female and immature.

Saxicola pallida, Rüpp., *apud* Rüppell, 1845 = *Oenanthe monacha* (Temminck, 1825: pl. 359, fig. 1): female and immature.

Saxicola oenanthe, Bechstein, Buffon *apud* Rüppell, 1845 = *Oenanthe oenanthe oenanthe* (Linnaeus, 1758: 186): non-breeding plumage.[55]

Saxicola aurita, (Temminck) *apud* Rüppell, 1837a = *Oenanthe hispanica melanoleuca* (Güldenstädt, 1775: 468; cf. Seebohm 1881): non-breeding plumage.

Saxicola stapazina, Gmel. et ***aurita*** Temm. *apud* Rüppell, 1845 = *Oenanthe hispanica melanoleuca* (Güldenstädt, 1775: 468, quot. Seebohm 1881): non-breeding plumage. [Rüppell also refers to Temminck 1824b: plate 281 (in error: *i.e.* 257) fig. 1, which is the adult male].

Saxicola deserti, Rüpp. Temm., *apud* Rüppell, 1845 = *Oenanthe deserti deserti* (Temminck, 1825: pl. 359, fig. 2): non-breeding plumage.

Saxicola rubicola, Bechstein, Buffon *apud* Rüppell, 1845 = *Saxicola torquatus rubicolus* (Linnaeus, 1766: 332): non-breeding plumage (cf. David & Gosselin 2002b: 263).[56]

Saxicola rubetra, Bechstein, Buffon *apud* Rüppell, 1845 = *Saxicola rubetra* (Linnaeus, 1758: 186): non-breeding plumage.[57]

Saxicola rufocinerea, Rüpp., *apud* Rüppell, 1845 = *Monticola rufocinereus rufocinereus* (Rüppell, 1837a: 76, pl. 27, figs. 1 & 2): adult male and female, immature.

Saxicola ? sordida, Rüpp., *apud* Rüppell, 1845 = *Cercomela sordida sordida* (Rüppell, 1837a: 75, pl. 26, fig. 2): adult.

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[55] Rüppell (1845) erroneously quoted '*Bechstein, Buffon Taf. 554 Fig. 1 und 2*'. However, Bechstein (1800–02) translated only the parts on the amphibians and reptiles, whilst the work containing pl. 554 is by Otto (1790: opposite p. 4), being a translation of Buffon (1778: 237–247).

[56] Rüppell (1845) referred to pl. 678, fig. 1 in Otto (1789: opposite p. 238), *nec* Bechstein (1800–02).

[57] Rüppell (1845) referred to pl. 678, fig. 2 in Otto (1789: opposite p. 238), *nec* Bechstein (1800–02).

Saxicola albiscapulata, (Rüpp.) *apud* Rüppell, 1837a = *Thamnobia*? (Swainson) *albiscapulata*, Rüpp. *apud* Rüppell, 1845 = *Saxicola rufiventris* Rüppell MS (cf. Salvadori 1914: 10) = *Thamnolaea cinnamomeiventris albiscapulata* (Rüppell, 1837a: 74(–75), pl. 26, fig. 1.): adult male and female, immature.
Saxicola semirufa, (Rüpp.) *apud* Rüppell, 1837a = *Thamnobia*? *semirufa*, Rüpp. *apud* Rüppell, 1845 = *Thamnolaea semirufa* (Rüppell, 1837a: 74, pl. 25, fig. 1 & 2): adult male and female, immature.
Saxicola cyanea, (Gmel.) Buffon, *apud* Rüppell, 1837a = *Monticola solitarius solitarius* (Linnaeus, 1758) or *Monticola solitarius longirostris* (Blyth, 1847).
Saxicola saxatilis, (Latham) Buffon, *apud* Rüppell, 1837a = *Monticola saxatilis* (Linnaeus, 1766).

***Malurus inquietus* Cretzschmar, 1830**: 55, pl. 36, fig. b
= *Curruca Famula* Hemprich & Ehrenberg, 1833: 'bb'
= *Scotocerca inquieta inquieta* (Cretzschmar, 1830)

Although the publication date of Cretzschmar's *Malurus inquietus* was given as 1827 in most recent checklists (cf. Watson *et al.* 1986: 126, Dickinson 2003: 556), the issue containing the name was published in 1830. Sharpe (1883: 213) listed *Curruca famula* Hemprich & Ehrenberg, 1828, as the assumed older synonym, but the year 1828 is also incorrect. *Curruca famula* Hemprich & Ehrenberg had been published on page 'bb' in the year 1833, after Cretzschmar's 1830 description.

***Malurus clamans* Cretzschmar, 1826**: 2 (–3), pl. 2, fig. a
= *Malurus clamans* Temminck, 1828: livr. 78, pl. 466, fig. 2
= *Spiloptila clamans* (Cretzschmar, 1826)

Watson *et al.* (1985: 154), followed *inter alia* by Dickinson (2003: 560), regarded Temminck as the first author of this species, although Temminck (1828) wrote in connection of the name *clamans*, reflecting the bird's strong voice, that its name had already been '*imposé par M. Ruppel* [*sic*].' In fact, it was Cretzschmar in 1826, who first named the taxon based on a MS name of Rüppell: *Das helltönende Rufen, mit welchem dieser kleine Vogel seine Anwesenheit zu erkennen giebt* [*sic*], *hat Rüppell zu der ihm ertheilten* [*sic*] *Benennung veranlasst* [The high-pitched call, with which the tiny bird indicates its presence, triggered Rüppell's naming of the species] (Cretzschmar 1826: 3). This statement of Cretzschmar may also count as evidence that Rüppell dispatched probably all specimens with MS names attached. Rüppell was, at the time Cretzschmar's description was published, still in Africa.

***Cinnyris proteus* Rüppell, 1840**: 91, footnote 1 [*nomen oblitum*: referred to ICZN]
= *Nectarinia cruentata* Rüppell, 1845: 26(–27), pl. 9 [*nomen protectum*: referred to ICZN]
= *Nectarinia senegalensis cruentata* Rüppell, 1845

Rüppell named the same taxon twice, in 1840 and in 1845. Rüppell (1840) proposed by indication a new species name *proteus* for the taxon, associating it with an illustration (pl. 295, fig. 2) and a bibliographic reference (pp. 117–118) in Levaillant's (1808, *nec* 1800) *Histoire Naturelle des Oiseaux d'Afrique* (ICZN 1999; article 12.2.1 and 12.2.7: indication). All birds in Levaillant's work lacked scientific binomials. Even though Rüppell (1840) believed his specimens to be similar, he nevertheless also provided his own description of his specimens (first footnote, p. 91). Additionally, Rüppell made reference to Levaillant's name Le Sucrier Protté [*nec* Proté], though latinised by Rüppell as *Cinnyris proteus*, a valid given name under the rules of the ICZN (1999). To further the confusion, Levaillant's bird, now considered a different subspecies to Rüppell's bird, had already been named by Linnaeus (1766: 186) as *Certhia senegalensis*. Rüppell's second description, from 1845, contains passages already given in 1840, clearly indicating that it is indeed the same taxon. Bonaparte (1850) was the first to synonymise *Cinnyris proteus* with *Nectarinia cruentata*, not however acknowledging priority, as it was before any international agreement on zoological nomenclature had taken place.

To my knowledge no one has ever used the senior synonym *Cinnyris proteus* Rüppell, 1840, which would pre-date the commonly used *Nectarinia cruentata* Rüppell, 1845, except in synonymy (cf. *i.a.* Rüppell 1845: 26, Murs & Prévost 1847: 87, Ferret & Galinier 1850: 248, Bonaparte 1850: 406, A. E. Brehm 1863: 211, Heuglin 1864: 262, Blanford 1868: 284, Heuglin 1869b: 228, Finsch 1870: 229, Blanford 1870: 352, Salvadori 1873: 450, Shelley 1878: 259, Gadow 1884: 93, Salvadori 1884: 125, Hartert 1891: 30, Shelley 1900: 100, Reichenow 1904–05: 462, Neumann 1906: 252, Hilgert 1908: 146, Salvadori 1914: 11, Moltoni 1937b: 250, Moltoni 1939: 36, Steinbacher 1949: 116, Cave & Macdonald 1955: 353, Smith 1957: 328, Toschi 1959: 399, Mackworth-Praed & Grant 1960: 795, Rand 1967: 234, Wolters 1979: 278, Nikolaus 1987: 250, Lewis & Pomeroy 1989: 495, Howard & Moore 1991: 425, Clements 2000: 547, Fry *et al.* 2000: 194, Cheke & Mann 2001: 236, Dickinson 2003: 707), meeting the condition of article 23.9.1.1 (ICZN 1999). However, although the condition given in article 23.9.1.2 (ICZN 1999) is assumed to be met, it has not been proved. The Zoological Records of 1954–2003 do not list any publication that cites the particular subspecies of Scarlet-chested Sunbird. Only general checklists, Ethiopian / North Kenyan avifaunae and the monograph of Cheke & Mann (2001) offer such detail.

Therefore, this case has been referred to the Commission (2 July 2004; Steinheimer in press: case 3330) for a ruling under the plenary power (IZCN 1999; article 23.9.3). While the case is under consideration, the junior synonym *Nectarinia cruentata* Rüppell, 1845, is to be maintained.

If the *nomen protectum* is accepted, then it is unnecessary to designate a lectotype for *Cinnyris proteus* Rüppell, 1840, a name which is based on a mixed type series consisting of Levaillant's (1808) plate of *N. senegalensis senegalensis* (Linnaeus, 1766) and specimens of *N. senegalensis cruentata* Rüppell, 1845.

***Serinus citrinelloides* Rüppell, 1840**: 95, pl. 34, fig. 1
= *Fringilla chrysola* Rüppell MS [incl. *Serinus canicollis flavivertex* (Blanford, 1869: 330)]
= *Serinus citrinelloides citrinelloides* Rüppell, 1840 [incl. *Serinus canicollis flavivertex* (Blanford, 1869: 330)]

The original description, and thus the syntypical series of *Serinus citrinelloides* Rüppell, 1840 includes two different taxa: a 'male' bird (juvenile male or female *fide* Neumann 1905) of *Serinus citrinelloides citrinelloides* Rüppell, 1840 (SMF 12653) and two females of *S. canicollis flavivertex* (Blanford, 1869) (SMF 66175, BMNH 1837.6.10.727). Even Hartert (1891: 58, no. 861a and 56, no. 843) referred to the female (SMF 66175) under the incorrect species. Neumann (1905: 354–355) first drew attention to this, but his comments have been ignored and have not affected the nomenclature. Independent of Neumann the same conclusion has been reached while working on BMNH Rüppell material. To prevent any further confusion of the taxonomy of Rüppell's type series, and according to Recommendations 74A to 74F and article 74 (ICZN 1999) the specimen SMF 12653 listed as no. 861 in Hartert (1891: 58) and as the 'Typus' in Steinbacher (1949: 118) is hereby designated as:[58]

Lectotype of *Serinus citrinelloides* Rüppell, 1840: 95: SMF 12653, juv. male or female, loc. Abyssinien [province Simen] (*fide* Rüppell 1840), date: [1832] (*fide* Steinbacher 1949), leg. Dr Wilhelm Peter Eduard Simon Rüppell, coll. Rüppell/Senckenberg Museum Frankfurt am Main.

Known *paralectotypes*: BMNH [?] 1837.6.10.727, female, loc. Abyssinia, date: [not given], leg. Dr Wilhelm Peter Eduard Simon Rüppell, coll. BMNH, ex. coll. Rüppell/Senckenberg Museum Frankfurt am Main, BMNH acqu. 1834 [=female of *Serinus canicollis flavivertex* (Blanford, 1869)]; SMF 66175, female, loc. Abyssinien, date: [not given], leg. Dr Wilhelm Peter Eduard Simon Rüppell, coll. Rüppell/Senckenberg Museum Frankfurt am Main [=female of *Serinus canicollis flavivertex* (Blanford, 1869)].

***Plocepasser melanorhynchus* Rüppell, 1845**: 74
= *Plocepasser melanorhynchus* Bonaparte, 1850: 444
= *Plocepasser mahali melanorhynchus* Rüppell, 1845

Sclater (1930: 717) regarded Rüppell's name as a *nomen nudum*, believing that the name was only subsequently made available by Bonaparte's (1850: 444) use of *Plocepasser melanorhynchus*, when he described the taxon briefly as *Simillimus praecedenti* [*i.e. Plocepasser mahali*], *sed minor et rectricibus minus marginatis*.

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[58] The wording complies with the Declaration 60, *Bull. Zool. Nomen.* 2003: 263; Recommendation 74G is followed.

According to Sclater (1930), Rüppell (1845: 78) had apparently named this taxon only within a tabular overview. Rüppell's name was considered to be a *nomen nudum*. Since then, Bonaparte has commonly been referred to as first author of *Plocepasser melanorhynchus* (*i.a.* Benson 1947: 29, Mackworth-Praed & Grant 1960: 863, Moreau & Greenway 1962: 5, and Dickinson 2003: 715).

However, Rüppell gave a detailed description and binominal name to the taxon nowadays assigned to Bonaparte's authorship, and Rüppell's original description, overlooked by these subsequent authors, is found on p. 74 (Rüppell 1845): *Ein dem von Dr. A. Smith in Südafrika entdeckten Plocepasser Mahali ungemein ähnlicher Vogel fand sich in der mir gemachten Sendung von Schoa vor. Der ganze Unterschied beschränkt sich darauf, dass bei jenem der etwas mehr robuste Schnabel verwaschen braunroth, bei demjenigen aus Schoa aber schwarz ist; dass ferner bei jenem der Bauch schmutzig isabell, bei diesem rein weiss ist; bei jenem die dunkelbraunen Steuerfedern nicht allein am Ende, sondern auch seitlich weiss gesäumt sind, während der nordafrikanische Vogel nur das Ende der Steuerfedern weiss gerandet hat. Vielleicht ist das Ganze nur climatische Varietät, die ich provisorisch mit dem Namen Plocepasser melanorhynchus zu bezeichnen vorschlage* [A bird, which is very similar to *Plocepasser Mahali* discovered by Dr A. Smith in South Africa, has been found in a consignment addressed to me from Shoa. The entire difference is limited to a black beak of the specimen from Shoa, whereas the former [i.e. Smith's] bird has a stronger, but washed brownish-red bill; the former bird has also a 'dirty isabelline', the latter a pure white belly; the former has its dark brown tail-feathers also laterally margined white, whereas the North African bird has white margins only at the tail tip. Perhaps the whole [phenomena] is just a 'climate variety', which I suggest to be provisionally named *Plocepasser melanorhynchus*].

A few pages later, as seen above, Rüppell (1845: 78) referred to his newly introduced name in a tabular list as well. Several subsequent authors accepted Rüppell's authorship for this new taxon (*i.a.* Gray 1849: Ord. II, Tribe IV, *Textor*, Bonaparte 1850: 444, Sharpe 1890: 246, Neumann 1905: 336, Steinbacher 1949: 117). As Sclater (1930) did not explicitly give reasons for treating Rüppell's name as *nomen nudum* (cf. ICZN 1999: 111 *nomen nudum*) Rüppell's name is valid and therefore this taxon should be cited as *Plocepasser mahali melanorhynchus* Rüppell, 1845: 74, even though Rüppell originally might have established the name provisionally only for a variety (cf. ICZN 1999 article 11.5.1 & 45.6.4). Article 23.9.1.1. (ICZN 1999) prevents treatment of Bonaparte's homonym as a *nomen protectum* because Rüppell's authorship of this taxon was cited as part of a valid name several times in the 20th century (e.g. Neumann 1905: 336, Steinbacher 1949: 117). One lectotype and one paralectotype of this taxon are at the Senckenberg Museum, Frankfurt (Hartert 1891: 67, Steinbacher 1949: 117), whilst the paralectotype formerly housed at the BMNH has not been traced.

***Ploceus larvatus* Rüppell, 1840**: 91, pl. 32, fig. 1
= *Ploceus melanocephalus* Rüppell MS
= *Ploceus flavoviridis* Rüppell, 1845: 69 (–70), pl. 29: *pro parte* females
= *Ploceus cucullatus abyssinicus* (Gmelin, 1789)

Rüppell described females of his own taxon, *Ploceus larvatus* Rüppell, 1840, under a new name *Ploceus flavoviridis* Rüppell, 1845 (pp. 69–70, cf. Steinbacher 1949).

***Ploceus erythrocephalus* Rüppell, 1845**: 71, *nec Ploceus erythrocephalus* Swainson, 1838: 308
= *Ploceus melanotis* Lafresnaye, 1839: 20,[59] *nec Ploceus melanotis* Swainson, 1837: 307
= *Ploceus leuconotus* Müller, 1851: 28
= *Malimbus rubriceps leuconotus* (Müller, 1851) *apud* Moreau & Greenway 1962: 60
= *Anaplectes melanotis melanotis* (Lafresnaye, 1840 [*sic*]) *apud* Dickinson 2003
= *Malimbus rubriceps leuconotus* (Müller, 1851)

According to ICZN (1999) article 23.3.5 a junior homonym, in this case *Ploceus melanotis* Lafresnaye, 1839, being preoccupied by *Ploceus melanotis* Swainson, 1837, may be replaced by the next oldest available name from among its synonyms. However, the next oldest name, *Ploceus erythrocephalus* Rüppell, 1845, is 'itself invalid' (junior homonym of *Ploceus erythrocephalus* Swainson, 1838) so that Moreau & Greenway (1962) correctly used *Ploceus leuconotus* of Müller, 1851 for *Malimbus rubriceps leuconotus* (Müller, 1851) (cf. ICZN 1999 article 60). Dickinson (2003) used the primary homonym *melanotis* and thereby transgressed the Code (ICZN 1999 article 52 and 53.3).

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[59] Lafresnaye published the account *Oiseau inédit du genre Tisserin* on pp. 20–21 in the Jan. 1839 issue of *Rev. Zool. Soc. Cuvierienne* Année 1839: 1–32. Moreau & Greenway 1962: 60, followed by Dickinson 2003: 724, cited the year of publication as 1840, as given on the title page of the entire volume.

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APPENDIX

Tabular, alphabetic overview of Rüppell's and Cretzschmar's bird names which are considered valid in modern nomenclature (taxonomy of Peters *et al.* 1934–87; nomenclature alterated accordingly to Steinbacher 1949, Sawyer 1952, David & Gosselin 2002a,b, and to the present paper [changes to Peters *et al.* 1934–1987 in bold]).

Accipiter badius sphenurus (Rüppell, 1836)
Accipiter rufiventris perspicillaris (Rüppell, 1836)
Accipiter tachiro unduliventer (Rüppell, 1836)
Alcippe abyssinica abyssinica (Rüppell, 1840)[61]
Alectoris melanocephala (Rüppell, 1835)
Anas sparsa leucostigma Rüppell, 1845
Anthus novaeseelandiae cinnamomeus Rüppell, 1840[62]
Apalis rufifrons rufifrons (Rüppell, 1840)[63]
Aplopelia larvata bronzina (Rüppell, 1837)[64]
Ardea goliath Cretzschmar, **1829**
Bostrychia carunculata (Rüppell, 1837)[65]
Bradypterus cinnamomeus cinnamomeus (Rüppell, 1840)
Burhinus capensis affinis (Rüppell, 1837)[66]
Buteo rufinus rufinus (Cretzschmar, **1829**)
Buteo (rufofuscus) augur **(**Rüppell, 1836**)**
Camaroptera brevicaudata brevicaudata (Cretzschmar, **1830**)[67]
Caprimulgus poliocephalus poliocephalus Rüppell, 1840[68]
Caprimulgus tristigma tristigma Rüppell, 1840
*Cecropis daurica melanocriss**us*** Rüppell, 1845[69]
Centropus monachus monachus Rüppell, 1837
Cercomela sordida sordida (Rüppell, 1837)

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[61] Dickinson (2003: 602) used the genus *Pseudoalcippe* for this African taxon.

[62] Dickinson (2003: 742) separated the African pipits under Rüppell's *cinnamomeus* from the *novaeseelandiae* species group.

[63] Dickinson (2003: 562) used the genus *Urorhipis* for this taxon. Rüppell (1840: 110) erroneously referred to pl. 41, fig. 2 instead of fig. 1.

[64] Dickinson (2003: 160) treated this taxon under the genus *Columba*.

[65] Rüppell (1837a: 49) erroneously referred to pl. 13 instead of 19.

[66] Dickinson (2003: 131) synonymised the subspecies *affinis* with *B. capensis maculosus* (Temminck, 1824).

[67] Dickinson (2003: 562) placed this subspecies in the species *C. brachyura*.

[68] Dickinson (2003: 243) treated *poliocephalus* as monotypic.

[69] See David & Gosselin (2002a: 34) for the spelling of *melanocrissus*.

Cisticola galactotes lugubris (Rüppell, 1840)
*Cisticola robust**us** robust**us*** (Rüppell, 1845)[70]
Cisticola ruficeps ruficeps (Cretzschmar, **1830**)
Colius striatus leucotis Rüppell, 1839
Columba albitorques Rüppell, 1837
Coracina melanoptera melanoptera (Rüppell, 1839)
Corvus crassirostris Rüppell, 1836
Cossypha semirufa semirufa (Rüppell, 1840)
Crinifer africanus zonurus (Rüppell, 1835)[71]
Crinifer leucogaster (Rüppell, 1842)[72]
*Crinifer personat**us** personat**us*** (Rüppell, 1842)[73]
*Cyanochen cyanopter**a*** (Rüppell, 1845)[74]
Dinemellia dinemelli dinemelli (Rüppell, 1845)
Emberiza caesia Cretzschmar, **1827**
*Emberiza flaviventris flavigastr**a*** Cretzschmar, 1828[75]
Emberiza tahapisi septemstriata Rüppell, **1837**[76]
Erythropygia leucophrys leucoptera (Rüppell, 1845)[77]
Euplectes capensis xanthomelas Rüppell, 1840
Francolinus africanus gutturalis (Rüppell, 1835)[78]
Francolinus erckelii erckelii (Rüppell, 1835)[79]
Glareola pratincola limbata Rüppell, 1845[80]
Indicator minor diadematus Rüppell, 1837
Jynx ruficollis aequatorialis Rüppell, 1842
Lagonosticta larvata larvata (Rüppell, 1840)
*Lamprotornis purpuropter**a** purpuropter**a*** Rüppell, 1845[81]
Laniarius barbarus erythrogaster (Cretzschmar, 1829)[82]
Lissotis melanogaster melanogaster (Rüppell, 1835)[83]
Lybius undatus undatus (Rüppell, 1837)
Macronyx flavicollis Rüppell, 1840
Melaenornis chocolatinus chocolatinus (Rüppell, 1840)
Melaenornis semipartitus semipartitus (Rüppell, 1840)[84]

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[70] See Dickinson (2003: 551) for treating *Cisticola* as a masculine noun.

[71] Dickinson (2003: 207) treated this taxon as monotypic.

[72] Dickinson (2003: 207) placed this species in the genus *Corythaixoides*.

[73] According to Dickinson (2003: 207) the gender of the genus *Crinifer* is masculine; Dickinson, however, placed this species in the genus *Corythaixoides*.

[74] According to David & Gosselin (2002b) the gender of the genus *Cyanochen* is female.

[75] Dickinson (2003: 779) erroneously used the male gender for this taxon; the genus *Emberiza* is female.

[76] The species name *septemstriata* was first published on pl. 30, fig. 2, in 1837. The text appeared subsequently in 1840 (cf. Sawyer 1952).

[77] Dickinson (2003: 679) lumped *Erythropygia* with *Cercotrichas*.

[78] Dickinson (2003: 51) placed the subspecies *gutturalis* in the species group of *F. levaillantoides*.

[79] Dickinson (2003: 53) treated this taxon as monotypic.

[80] Dickinson (2003: 146) synonymised this subspecies with nominate *G. pratincola*.

[81] See David & Gosselin (2002a: 39) for the spelling of *purpuroptera*.

[82] Dickinson (2003: 460) upgraded *erythrogaster* to a monotypic species.

[83] Pl. 7, illustrating '*Otis melanogaster mas.* (Rüppell)' was published subsequently to the text in 1836.

[84] Dickinson (2003: 690) placed this taxon in its own genus *Empidornis*.

Monticola rufocinereus rufocinereus (Rüppell, 1837)
Myrmecocichla albifrons albifrons (Rüppell, 1837)
Myrmecocichla melaena (Rüppell, 1837) [85]
Nectarinia senegalensis cruentata Rüppell, 1845[86]
Neotis ludwigii (Rüppell, 1837)
Neotis nuba (Cretzschmar, 1826)
Oenanthe lugens lugubris (Rüppell, 1837)[87]
Onychognathus albirostris (Rüppell, 1836)
Onychognathus tenuirostris tenuirostris (Rüppell, 1836)
Parisoma lugens lugens (Rüppell, **1840**)[88]
Parus leucomelas leucomelas Rüppell, 1840
Passer griseus swainsonii (Rüppell, 1840)
Phyllolais pulchella (Cretzschmar, **1830**)
Phylloscopus umbrovirens umbrovirens (Rüppell, 1840)
Plocepasser mahali melanorhynchus **Rüppell, 1845**
Plocepasser superciliosus (Cretzschmar, 1827)
Ploceus galbula Rüppell, 1840
Ploceus intermedius intermedius Rüppell, 1845
Ploceus rubiginosus rubiginosus Rüppell, 1840
Poicephalus flavifrons flavifrons (Rüppell, **1842**)[89]
Poicephalus meyeri meyeri (Cretzschmar, 1827)
Poicephalus rufiventris rufiventris (Rüppell, **1842**)[90]
Prionops plumatus cristatus Rüppell, 1836[91]
Psalidoprocne pristoptera pristoptera (Rüppell, **1840**)[92]
Pteropodocys maxima maxima (Rüppell, 1839)[93]
Rhinopomastus minor minor (Rüppell, 1845)
Saxicola torquatus albofasciatus Rüppell, **1840**[94]
Scotocerca inquieta inquieta (Cretzschmar, **1830**)
Serinus atrogularis xanthopygius Rüppell, 1840
Serinus citrinelloides citrinelloides Rüppell, 1840
Serinus nigriceps Rüppell, 1840
Serinus striolatus striolatus (Rüppell, 1840)[95]

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[85] On pl. 28, fig. 2 (Rüppell 1837a) as *Saxicola melas*, syononym of *Myrmecocichla melaena* (Rüppell, 1837: 77).

[86] Dickinson (2003: 707) placed this taxon in the genus *Chalcomitra*.

[87] Dickinson (2003: 685) separated this taxon from *O. lugens*.

[88] The year of publication is given in Watson *et al.* (1986: 267) as 1804, a typographic error for 1840.

[89] The original description of *Pionus flavifrons* Rüppell, 1842a, was published on p. 126 in *Mus. Senckenbergianum* 3(2); later copied in Rüppell (1845: 81–82). Dickinson (2003: 195) treated the species as monotypic.

[90] The original description of *Pionus rufiventris* Rüppell, 1842a, was published on p. 125 in *Mus. Senckenbergianum* 3(2); later copied in Rüppell (1845: 83).

[91] See David & Gosselin (2002b) for the male gender of the genus *Prionops*.

[92] Steinbacher (1949: 114) gave the wrong date: p. 105 and pl. 39 were published in 1840.

[93] Dickinson (2003: 465) placed *Pteropodocys* in the genus *Coracina*.

[94] The original description of *Saxicola torquatus albofasciatus* Rüppell, 1840, was published on p. 115, in *Neue Wirbelthiere zu der Fauna von Abyssinien gehöhrig*; Rüppell (1845: 39, pl. 16) repeated the description. See David & Gosselin (2002b: 263) for the spelling of the taxon.

[95] The type genus was *Pyrrhula* (not *Serinus* as in Dickinson 2003: 748).

Serinus tristriatus Rüppell, 1840
Spiloptila clamans (**Cretzschmar, 1826**)
Spreo pulcher rufiventris (Rüppell, **1836**)[96]
Spreo superbus (Rüppell, 1845)[97]
Stephanibyx melanopterus melanopterus (Cretzschmar, 1829)[98]
Streptopelia lugens lugens (Rüppell, 1837)[99]
Streptopelia semitorquata semitorquata (Rüppell, 1837)[100]
Sylvia hortensis crassirostris Cretzschmar, **1830**
Tauraco leucotis leucotis (Rüppell, 1835)
Thalasseus bergii velox (Cretzschmar, **1827**)[101]
Thamnolaea cinnamomeiventris albiscapulata (Rüppell, 1837)
Thamnolaea semirufa (Rüppell, 1837)
Thripias namaquus schoensis (Rüppell, 1842)[102]
Tockus flavirostris flavirostris (Rüppell, 1835)[103]
Trachyphonus margaritatus margaritatus (Cretzschmar, **1828**)
*Tricholaema melanocephal**a** melanocephal**a*** (Cretzschmar, **1829**)[104]
*Turdoides leucopygi**a** leucopygi**a*** (Rüppell, **1837**)[105]
*Turdoides leucopygi**a** limbat**a*** (Rüppell, 1845)
*Turdoides plebejus leucocephal**a*** Cretzschmar, **1826**[106]
Turdoides plebejus plebejus (Cretzschmar, 1828)
*Turdoides rubiginos**a** rubiginos**a*** (Rüppell, 1845)
Turdoides squamiceps squamiceps (Cretzschmar, 1827)
Turdus litsipsirupa simensis (Rüppell, **1837**)[107]
Tylibyx melanocephalus (Rüppell, 1845)[108]

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[96] Dickinson (2003: 657) indicated that *rufiventris* is a synonym of *Lamprotornis* (*Spreo*) *pulcher*. Rüppell (1836: 27, pl. 11, fig. 1) gave an alternative name, *Lamprotornis chrysogaster abyssinica* Rüppell, 1836, which is a synonym of *Spreo pulcher rufiventris* (Rüppell, 1836).

[97] Dickinson (2003: 657) placed this taxon in the genus *Lamprotornis*.

[98] In Dickinson (2003: 133) as *Vanellus m. melanopterus*.

[99] Dickinson (2003: 160) treated the species as monotypic.

[100] Dickinson (2003: 161) treated the species as monotypic.

[101] In Dickinson (2003: 150) as *Sterna bergii velox*.

[102] The Code (ICZN 1999, article 27) explicitly states that no diacritic marks are to be used in scientific names, thus the original *schoënsis* must become *schoensis*. Dickinson (2003: 317) placed the species in the genus *Dendropicos*.

[103] In Dickinson (2003: 298) this taxon is monotypic.

[104] The gender of the genus *Tricholaema* is female according to David & Gosselin (2002b).

[105] The gender of the genus *Turdoides* is female according to David & Gosselin (2002b). The species was originally described as *Ixos leucopygius* on pl. 30, fig. 1, in 1837. The text appeared subsequently in 1840 (cf. Sawyer 1952).

[106] Dickinson (2003: 611) upgraded *T. leucocephala* to species level.

[107] The species name *simensis* was first published on pl. 29, fig. 1, in 1837. The text appeared subsequently in 1840 (cf. Sawyer 1952). Dickinson (2003: 666) referred to this taxon as *Psophocichla litsipsirupa simensis*.

[108] In Dickinson (2003: 134) as *Vanellus melanocephalus*.

Taxonomy, vocalisations and natural history of *Philydor dimidiatum* (Furnariidae), with comments on the systematics of *Syndactyla* and *Simoxenops*

by Mark B. Robbins & Kevin J. Zimmer

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Because of the inherited nature of vocalisations within the suboscines (Lanyon 1978, Kroodsma 1984, 1989), vocalisations are often a strong indication of relationships within this group. In the Neotropical family Furnariidae, vocalisations in concert with morphological and behavioural aspects have been used to elucidate relationships at the species and generic level (Parker *et al.* 1985, Whitney & Pacheco 1994, Kratter & Parker 1997, Zimmer 1997, 2002, Remsen 2003). In fact, Vaurie's (1971, 1980) systematic revisions of this family, which did not include vocal information, but were based primarily on plumage and external structural characters, led to conclusions that have not been accepted by the Neotropical ornithological community (Fitzpatrick 1982, Sibley & Monroe 1990, Ridgely & Tudor 1994, Remsen 2003).

During a general avian inventory of San Luis National Park, in the cerrado of northern Paraguay (Robbins *et al.* 1999), just after dawn on 22 October 1996, MBR tape-recorded (MLNS 107157 [all abbreviations are listed in the Acknowledgements]) a furnariid that he presumed, based on voice, to be a *Syndactyla*. Upon collecting the singing bird's mate (Univ. of Kansas Natural History Museum [KUNHM] 88363), MBR was surprised to discover that it was a *Philydor dimidiatum*. In addition to its *Syndactyla*-like voice, the bird had a slightly upturned mandible like other *Syndactyla*, and the plumage was reminiscent of *Syndactyla ruficollis*, a species long allocated to *Automolus* until vocal data led to its transfer to *Syndactyla* (Parker *et al.* 1985, Ridgely & Tudor 1994; see below).

Here we present vocal, plumage and morphological characters that lead us to hypothesise that *Philydor dimidiatum* is indeed more closely related to other *Syndactyla* than to taxa currently included in *Philydor*. Further, we comment on the possible close relationship of *dimidiatum* to *Simoxenops* and on the relationship between *Simoxenops and Syndactyla*. Based on limited sample sizes, it appears that within at least the Paraguayan *dimidiatum* population, sexual dichromatism is marked, an unusual trait in Furnariidae. Finally, we present information on habitat preferences, foraging, breeding and singing behaviour of this poorly known species.

Methods

We assume that vocalisations of foliage-gleaners, like those of other suboscines, are mostly or entirely inherited (Kroodsma 1984, 1989, Kroodsma & Konishi 1991), and consequently provide potentially informative characters for systematic study (Parker *et al.* 1995, Kratter & Parker 1997, Zimmer 1997, 2002, Remsen 2003). To analyse vocalisations, we assembled recordings of all but one, *Syndactyla guttulata*, of the currently recognised species of *Philydor*, *Syndactyla* and *Simoxenops*. Our personal recordings provided sufficient material for most species in these groups, but we supplemented these with material from other recordists, and, in two instances, from commercial compilations of bird recordings (see below). We excluded *Philydor novaesi* from consideration in our analysis, because certain aspects of its vocal repertoire are anomalous relative to all other members of the genus (KJZ unpubl.), and because our sample sizes were judged too small to support meaningful conclusions. We made auditory comparisons of all recordings and visual comparisons of spectrograms of each species for which representative recording samples were available. Vocalisations selected for illustration as spectrograms in this paper were deemed representative based on auditory comparison of the entire inventory, and on visual comparison of spectrograms of a smaller sample. Locations and recordists for all recordings examined are presented in Appendix 1.

We encourage readers to compare our descriptions of vocalisations with various commercially available sound compilations. The following collectively contain examples of vocalisations of many of the species involved in this study, and also will assist in interpreting the spectrograms: *Syndactyla rufosuperciliata* (Schulenberg 2000b); *S. subalaris* (Moore *et al.* 1999, Schulenberg 2000b); *Simoxenops striatus* (Schulenberg 2000a); *S. ucayalae* (Schulenberg *et al.* 2000); *Philydor rufum* (Moore *et al.* 1999); *P. fuscipenne* (Jahn *et al.* 2002, Moore *et al.* 2002); *P. erythrocercum* (Moore 1996, Schulenberg 2000a, Schulenberg *et al.* 2000); *P. pyrrhodes* (Moore 1996, Schulenberg *et al.* 2000); *P. erythropterum* (Moore 1996, 1997, Schulenberg *et al.* 2000); *P. ruficaudatum* (Schulenberg *et al.* 2000). Note that recordings from these sources are not included in our inventory, although the recordings of *Simoxenops striatus* (T. A. Parker recording; Schulenberg 2000a) and *Philydor fuscipennis* (M. Lysinger recordings; Moore *et al.* 2002) were consulted for want of other material.

For comparison, vocalisations were categorised as loudsongs or calls. Loudsongs were consistently patterned multi-note vocalisations (Isler *et al.* 1997), given seemingly in the context of territorial advertisement. Vocalisations characterised as calls usually were structurally simple (typically involving well-spaced repetition of identical notes or pairs of notes). These were given most frequently in the context of contact notes between mates, or as aggression calls during territorial conflicts with conspecifics, or in response to playback. Exceptions are noted in the results below. Our recordings were made with Sony TC D5 Pro-II and Sony TCM-5000 recorders and Sennheiser ME-67, ME-80 and MKH-70 shotgun microphones. Spectrograms used in illustrations were made by P. R. Isler on a Macintosh G4 computer using Canary version 1.2.1 (Bioacoustics Research Program, Cornell Laboratory of Ornithology, Ithaca, New York), Canvas graphics software (version 5.0.3, Deneba Software, Miami, Florida) and a Hewlett Packard Laserjet 6MP printer.

Dimidiatum specimens examined: Paraguay: two adult females and adult male, San Luis National Park (KUNHM 88362–3, Museo Nacional de Historia Natural del Paraguay, MNHNP); adult male, Apa Mts., Zanja Moroti (ZSM 32.814); adult male, Apa Mts., San Luis de la Sierra (ZSM 32.815). Brazil: *baeri* from Goiás (FMNH 75118, LACMNH 39956–7); adult female IBGE Reserve in Brasília, Distrito Federal (BMNH 1984.1.6); adult male and immature male, western Minas Gerais, Agua Suja at Bagagem (ZSM 1911.83; holotypes); adult male, Patrocínio, Minas Gerais (MNRJ 32973); adult male, Reserva Biológica do IBGE, Distrito Federal (MNRJ 33235); adult male, Nova Ponte, Minas Gerais (DZUFMG 707); an unsexed individual and adult female, Campo Alegre (between Serro and Minas Novas), Minas Gerais (DZUFMG 708–09); adult male Porto Camargo, Paraná (MZUSP 36872); adult female and immature male, Sangrador, Mato Grosso (NMW 16.359–60); immature male, rio Manso, Mato Grosso (NMW 19.353); adult male, Fazenda Recreio, Coxim, Mato Grosso (MZUSP 17258); male?, Sant'Anna do Parnaiba, Mato Grosso (MZUSP 12748).

Behavioural and habitat data are from field work conducted by MBR in 1996–97 (northern Paraguay), and by KJZ in 2002 and 2004 (Distrito Federal, Brazil), supplemented by observations made by A. Whittaker in 1996 in Minas Gerais, Brazil. All measurements used in behavioural data (distances, heights, etc.) are estimates.

Results

Vocalisations

The loudsong of *P. dimidiatum* (Figs. 1a–d, 1g) is a slow rattle with a distinctly nasal quality. It typically consists of a stuttering prelude or preamble of lower amplitude notes that accelerates into a higher amplitude series of fairly evenly paced and strident, nasal notes that may rise and fall somewhat in frequency (5–8 kHz) before accelerating toward the finale. The nasal notes can be distinguished in the spectrograms (Figs. 1a–d) by their difference in width relative to the introductory and terminal notes. The loudsongs vary greatly, both among individuals and from one song to the next within the same individual. Songs may vary greatly in overall length, and particularly in the presence or absence of a preamble, its length, and the extent to which it stutters (versus being evenly paced). These differences appear to be exacerbated by tape playback, and depending on the degree of agitation, the differences within a single individual's songs can be marked. Some of the observed variation may be the result of sexual differences. KJZ tape-recorded what appeared to be a mated pair in Brasília National Park

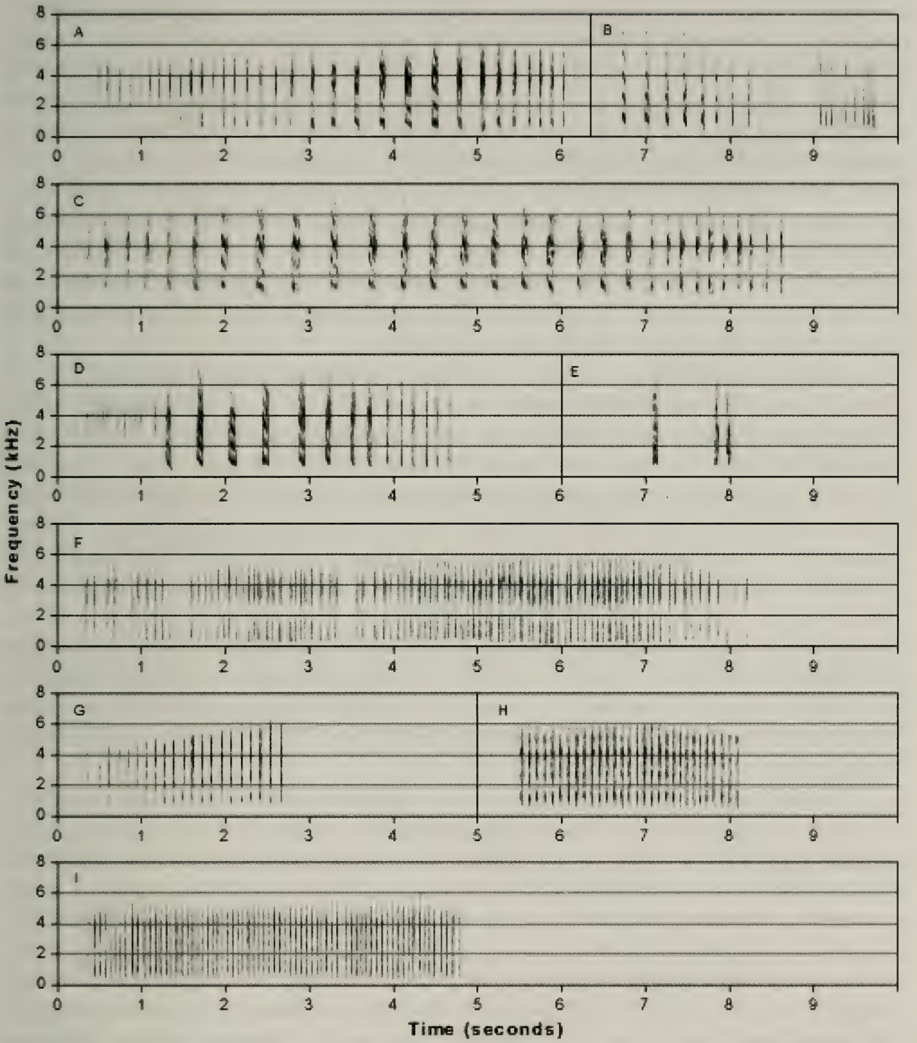

Figure 1. Vocalisations of *Philydor dimidiatum*. (a) natural song, from Brasília National Park, Distrito Federal, Brazil (21 August 2002; K. J. Zimmer). (b) different individual; short song, followed by rattle call, Brasília National Park, Distrito Federal, Brazil (20 August 2002; K. J. Zimmer). (c) responsorial song of male–female duet, Brasília National Park, Distrito Federal, Brazil (21 August 2002; K. J. Zimmer). (d) initiating song of male–female duet, Brasília National Park, Distrito Federal, Brazil (21 August 2002; K. J. Zimmer). (e) call notes, Brasília National Park, Distrito Federal, Brazil (20 August 2002; K. J. Zimmer). (f) one rattle call, response to playback, Brasília National Park, Distrito Federal, Brazil (21 August, 2002; K. J. Zimmer). (g) natural song, San Luis National Park, Paraguay (22 October 1996; M. B. Robbins; MLNS 120469). (h) rattle call in response to playback, San Luis National Park, Paraguay (27 October 1996; M. B. Robbins; MLNS 120470). (i) rattle call in response to playback, Patas de Minas, Minas Gerais, Brazil (27 December 1996; A. Whittaker). All spectrograms by P. R. Isler.

(Distrito Federal, Brazil) that sang repeated duets, in which one bird consistently initiated the duet, and the other delivered its song in a responsorial fashion, usually immediately after the termination of the initiating bird's song. The song of the bird that initiated the duets (Fig. 1d; the presumed male, although this could not be verified) was usually preceded by a low-amplitude preamble and contained roughly half the number of high-amplitude, nasal notes as the song of the responding bird (Fig. 1c), the song of which typically lacked any preamble. The few loudsongs recorded in Paraguay (Fig. 1g) sound generally similar to those from central Brazil in pattern, although distinctly less nasal in quality, as evidenced by the lack of change in note-shape over the course of the song. The significance of this apparent difference is difficult to assess given the small sample size of loudsongs from Paraguay and individual variation as noted above.

Apart from loudsongs, two other types of vocalisations were recorded from *P. dimidiatum*. One was a single-noted or doubled *TCHACK* or *TCHEK* (6–7 kHz), with a harsh, slightly nasal quality (Fig. 1e). These calls were given as contact notes between members of pairs that were separated whilst foraging. They were also given as aggression calls in response to playback. The other vocalisation type was a somewhat harsh-sounding rattle, generally evenly paced and of fairly uniform frequency (*c.*6 kHz), but varying greatly in length (1–10 seconds) (Figs. 1f, 1h, 1i). As noted with loudsongs, variation in the length of rattle calls appeared to be as great within individuals as among individuals, and was particularly susceptible to the influence of playback. Rattle calls were often given immediately before or after loudsongs, but were also given as antagonistic calls in response to the vocalisations of a neighbouring conspecific or to playback. Birds responding to playback consistently gave longer rattles. Rattle calls from Paraguay (Fig. 1h) sounded similar to those from Brazil (Figs. 1b, 1f, 1i).

Our inventory of recordings included vocalisations of three of the four currently recognised species of *Syndactyla* (*subalaris*, *ruficollis*, *rufosuperciliata*). Loudsongs of these three species (Figs. 2a, 2c, 2e) were remarkably similar in pattern and quality, and consisted of a series of nasal, chattering notes (1.5–3.5 seconds in duration, delivered at *c.*6–8 kHz) that usually accelerated markedly toward the end and often ended abruptly. The terminal, more closely spaced notes were less nasal in quality compared to the introductory and middle notes of the song, as evidenced by the difference in note-width. As with *P. dimidiatum*, songs of the three *Syndactyla* species varied greatly in length, frequency shifts and pace changes (acceleration or deceleration within the song), both among individuals in a population and from one song to the next from the same individual, and were influenced by playback and degree of agitation of the responding bird. Calls of the three *Syndactyla* species (Figs. 2b, 2d, 2f) were also remarkably uniform between species, consisting of a harsh, nasal *TCHEK*, *TCHECH* or *TCHAK* (6–8 kHz).

Loudsongs of *Simoxenops ucayalae* resembled those of *P. dimidiatum* and the three *Syndactyla* species in being a long series of closely spaced, harsh notes, with a distinctly nasal quality (Figs. 2g,h) They were lower in frequency (*c.*3–4 kHz)

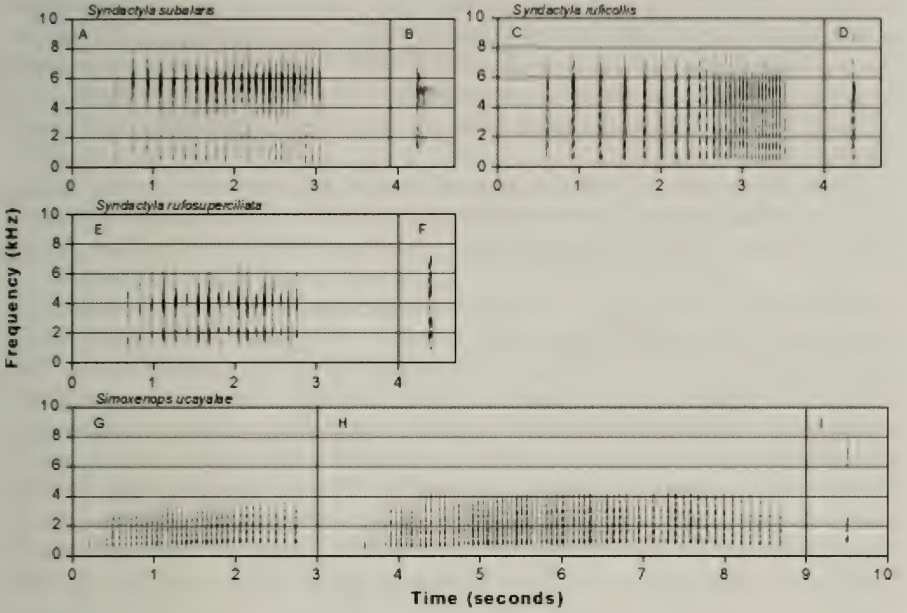

Figure 2. Vocalisations of various species of *Syndactyla* and *Simoxenops* foliage-gleaners. (a) *Syndactyla subalaris*: natural song, Monteverde Cloud Forest Reserve, Costa Rica (March 1994). (b) *Syndactyla subalaris*: single-note call, Cerro de la Muerte, Costa Rica (March 1997). (c) *Syndactyla ruficollis*: natural song, Abra Porculla, dpto. Piura, Peru (24 January 2001). (d) *Syndactyla ruficollis*: single-note call, Abra Porculla, dpto. Piura, Peru (24 January 2001). (e) *Syndactyla rufosuperciliata*: natural song, Serra do Caraça, Minas Gerais, Brazil (6 September 2001). (f) *Syndactyla rufosuperciliata*: single-note call, Itatiaia National Park, Rio de Janeiro, Brazil (21 October 1998). (g) *Simoxenops ucayalae*: natural song, Serra dos Carajás, Pará, Brazil (9 February 2003). (h) *Simoxenops ucayalae*: long song in response to playback, Alta Floresta, Mato Grosso, Brazil (25 August 1991). (i) *Simoxenops ucayalae*: single-note call, Alta Floresta, Mato Grosso, Brazil (25 August 1991). All recordings by K. J. Zimmer. All spectrograms by P. R. Isler.

than the loudsongs of *P. dimidiatum* or *Syndactyla*, but varied similarly in overall song-length (*c*.3–5 seconds), frequency shifts and in changes of pace (acceleration and deceleration) between songs from the same individual. Like *P. dimidiatum* and the *Syndactyla* species, this variation was subject to influence by playback and the degree of agitation of the responding bird. In contrast to the three *Syndactyla* species, the loudsongs of *Simoxenops ucayalae* typically accelerated more markedly over the first part of the song and slowed at the end, but still ended abruptly. In this respect, they were more similar to loudsongs of *P. dimidiatum*, which often commenced with a preamble of closely spaced notes that then slowed to the main series of more widely spaced nasal notes. Loudsongs of *S. ucayalae* were also similar to those of *P. dimidiatum* in often beginning with a stuttering start of lower frequency and lower amplitude notes. Our inventory contained only a single recording of *Simoxenops striatus*, and this precludes generalisations concerning its vocalisations. However, loudsongs of the single *striatus* were similar to those of *ucayalae* in pattern and quality. The call of *S. ucayalae* is a harsh, nasal *TCHAK* (Fig. 2i), similar to that of *P. dimidiatum* and the three *Syndactyla* species surveyed.

The eight species of *Philydor* analysed (excluding *dimidiatum*) can be divided into three vocal groups based on differences in loudsongs. The first group consists of *P. lichtensteini* and *P. erythrocercum*. Loudsongs of these species (Figs. 3a, 3d) consist of a countable series of distinctly spaced, sharp or squeaky notes. The second group includes *P. atricapillus*, *P. erythropterum* and *P. pyrrhodes*. Loudsongs in this group (Figs. 3b, 3c, 3e) consist of a long series of uncountable, closely spaced notes that form a trill. In general, these songs show relatively slight changes in frequency from start to finish, although that of *P. pyrrhodes* is distinguished by a distinct change in amplitude commencing with the middle third of the song (Fig. 3e). The third group includes *P. rufum*, *P. ruficaudatum* and *P. fuscipenne*. Loudsongs of these species (Fig. 3f) are somewhat intermediate (relative to the other two groups) with respect to the number of notes and the spacing. They could be characterised as rattles that change in pace or frequency (sometimes several times) over the course of the song, and that have a more 'staccato' or 'ratchety' quality. None of the eight species considered here has a loudsong whose notes could be characterised as imparting (either individually or in entirety) a 'nasal' quality. In marked contrast to *P. dimidiatum*, the various *Syndactyla* species and *Simoxenops ucayalae*, none of the eight species of *Philydor* shows any tendency for marked intra-population variation in song characters, either between or within individuals. Also in contrast to *P. dimidiatum*, *Syndactyla* and *Simoxenops ucayalae*, *Philydor* species do not conspicuously alter the length or other aspects of their loudsongs in response to playback. However, in response to playback, *P. pyrrhodes* does regularly give a long, low-amplitude rattle call similar to the loudsong but without shifts in amplitude, pace or frequency (KJZ unpubl.).

Calls of the eight *Philydor* species (excluding *dimidiatum* and *novaesi*) show no unifying threads, and vary considerably from one species to the next. Calls from our inventory are as follows: (a) *erythrocercum*—an explosive, somewhat squeaky *SQUEET!* or an ascending, loud *WHEEEK!*; (b) *ruficaudatum*—a thin, brittle rattle *tsissiitt* with the quality of a waxwing (*Bombycilla*); (c) *fuscipenne*—a thin, sharp *cheet* or *steet*, and a short, staccato *chidideet*; (d) *rufum*—a hard *JIK!*; (e) *atricapillus*—a squealing, loud *SKEW* or *SPREE*, and a loud series of 3–4 ascending whistled *TWEEEET* notes; (f) *lichtensteini*—a thin, abbreviated fast rattle *skit't't'r'r'r'tt*; (g) *erythropterum*—a shrill *KREEEAH* or *KREEER*; (h) *pyrrhodes*—a hard *chidit* or *chikit* and, in response to playback, a prolonged, low-amplitude rattle (sometimes lasting up to 30 seconds).

Behaviour

In northern Paraguay and in Minas Gerais, Brazil (A. Whittaker, G. M. Kirwan pers. comms.), presumed pairs were observed singing and foraging solitarily, once in association with a mixed-species flock, at *c*.4–12 m above ground in the dense vine tangle-dominated understorey of semi-humid forest. Birds were observed hitching up vines and small saplings as they foraged. Whittaker observed a foliage-gleaner capture a centipede and remove its exoskeleton before swallowing it. Following playback, males responded by approaching and counter-singing from perches within dense vegetation. When counter-singing, the head was held upward at *c*.45° and the wings and tail vibrated.

At Brasília (Distrito Federal, Brazil), pairs of *P. dimidiatum* occupied semi-humid gallery forest. Members of presumed mated pairs foraged mostly in fairly close association, maintaining contact through regular vocalisations. They foraged 1.5–12.0 m above ground, but primarily at 3–7 m, hitching through woody vine tangles or along more open limbs. Foraging birds regularly flicked both wings simultaneously, a movement that was usually accompanied by a simultaneous shallow vertical flick of the tail. Arthropod prey was mostly gleaned from branch or vine surfaces by reaching, followed by a quick stab of the bill. Acrobatic manoeuvres, such as hanging, were occasionally employed, and birds regularly used their bill to hammer at loose bark, stems or dead leaves, sometimes probing into arboreal leaf litter suspended in vines. KJZ videotaped one individual that seized a small dead twig with its bill, broke it off at the base, then used its foot to secure the twig while repeatedly hammering and probing in the fractured end of the twig with its bill, much in the manner of a *Xenops*. On one occasion, a pair of *dimidiatum* foraged in loose association with a mixed-species flock of insectivores; all other observations of the species from Brasília were of solitary pairs or individuals.

Morphology

The recent collection of two females from Paraguay reveals that sexual dichromatism is marked in *P. dimidiatum*, at least in the Paraguayan population (Fig. 4). The adult female specimens (KUNHM 88362–3) are distinct ventrally from the adult male (deposited at MNHNP; MLNS 107158; presumed mate of KUNHM 88362) taken at the same site and from two adult males taken within 75 km (ZSM 32.814, 32.815). The chin and centre of the throat of each of the two females are pale buffy-white contrasting with the cinnamon-rufous throat-sides and malar region. The centre of each breast and abdominal feather is ochraceous, contrasting with the remainder of the feather, which is tinged cinnamon-rufous. The ochraceous shafts are particularly conspicuous on the brownish-olive flank feathers (Fig. 4). As stated earlier, this pattern gives the underparts an indistinctly flammulated appearance, somewhat like those of *Syndactyla ruficollis* (see Ridgely & Tudor 1994: pl. 9). Flammulations on the underparts are less conspicuous in Paraguayan males, in which the ventral surface matches that of specimens from

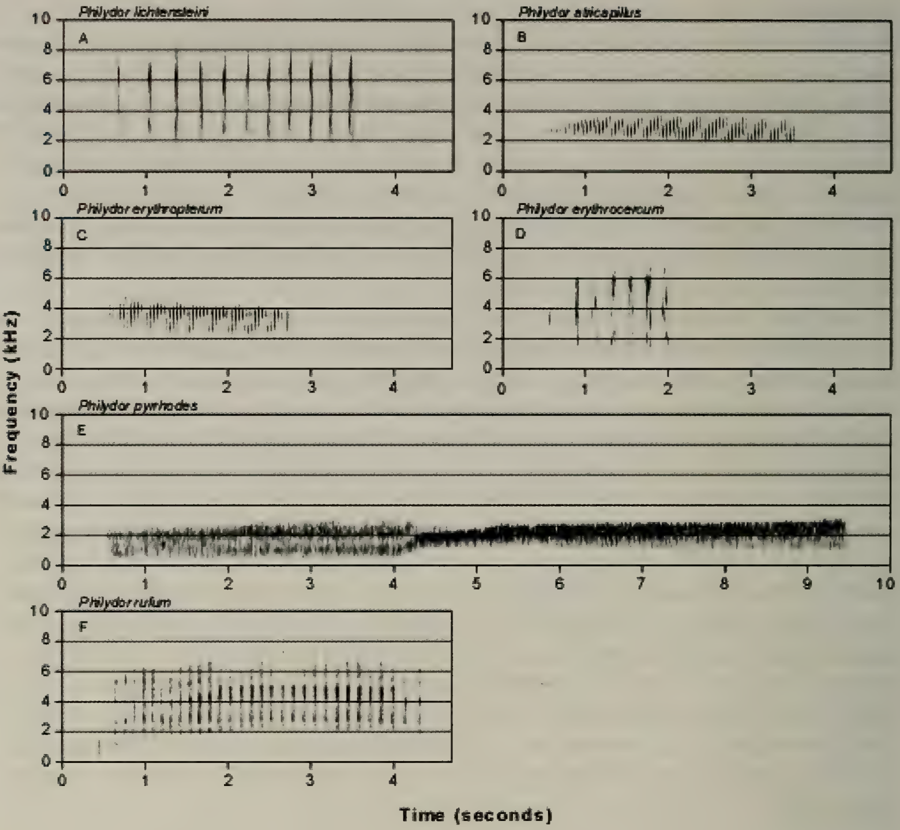

Figure 3. Vocalisations of various species of *Philydor* foliage-gleaners. (a) *P. lichtensteini*: song, response to playback, Iguaçu National Park, Paraná, Brazil (12 October 1999). (b) *Philydor atricapillus*: song, response to playback, Iguaçu National Park, Paraná, Brazil (23 September 2002). (c) *Philydor erythropterum*: natural song, Manu Wildlife Center, dpto. Madre de Dios, Peru (5 August 2000). (d) *Philydor erythrocercum*: song in response to playback, Caxiuanã, Pará, Brazil (3 August 2001). (e) *Philydor pyrrhodes*: natural song, Tambopata Research Center, dpto. Madre de Dios, Peru (19 August 1994). (f) *Philydor rufum*: natural song, Itatiaia National Park, Rio de Janeiro, Brazil (18 October 2000). All recordings by K. J. Zimmer. All spectrograms by P. R. Isler.

throughout the known distribution of the species. The only other females are of an apparent adult taken in Brasília, Distrito Federal (BMNH 1984.1.6), an adult female from Sangrador, Mato Grosso (NMW 16.359) and another, apparently adult, taken at Campo Alegre, Minas Gerais (DZUFMG 709). At least one bird videotaped by KJZ in Brasília had vaguely flammulated underparts similar to those of the females collected in Paraguay; the underparts of the other individual videotaped could not be seen well enough to permit comparison of this feature.

The following data from KUNHM, one MNRJ and the BMNH specimens are the first published mass and soft-part coloration data for the species: both females 31 g, two males 29 g and the other (MNRJ 33235) 31 g; none exhibited fat nor any moult. Irides brown (very dark chestnut in MNRJ 33235), maxilla dark brown, mandible pale grey or horn (described as greenish horn for MNRJ 33235), with a pinkish base, and tarsi olive or greenish. Based on vocalisations and gonad size, this species was breeding at the San Luis site in late-October 1996, as were many other avian species (Robbins *et al.* 1999). The male's largest testis was 12 x 6.5 mm and both females had recently laid, as they had convoluted oviducts 4 mm in diameter. One female had a completely ossified skull and the other's was 50% ossified, but neither had a bursa of Fabricius. Other specimen data are: one male from Brazil (MNRJ 33235), taken in early November, had testes of 7 x 5 mm, and the female taken in Minas Gerais, Brazil, had an oviduct of 5 x 3 mm in mid June. Pairs of *dimidiatum* at Brasília were vocal and territorial in August 2002, suggesting breeding during that time. At the same spot in February 2004, they were silent and unresponsive to playback, suggesting a lack of breeding activity. In Minas Gerais the species appears to be most vocal (and responsive to playback) in September to January, which would accord with the general breeding season for birds in this region (G. M. Kirwan pers. comm.).

Discussion

Philydor dimidiatum is one of the most poorly known birds in the Western Hemisphere; we located only 20 museum specimens and only 12 of those had additional data beyond locality and collection date. Only five of the 20, all collected relatively recently, were females. Presumably, the combination of small sample sizes and the lack of modern data has led to some confusion concerning distribution and plumage. As currently treated (Remsen 2003), *P. dimidiatum* consists of two subspecies: nominate *dimidiatum* and *baeri*. Peters (1951) outlined nominate *dimidiatum* as restricted to southern Mato Grosso, with *baeri* in Minas Gerais and Goiás, Brazil, and in north-east Paraguay. However, Ridgely & Tudor (1994) attributed Paraguayan birds to the nominate race. Direct comparison of the adult male *baeri* holotype with the two adult male Paraguayan specimens at ZSM demonstrated that the birds are virtually indistinguishable. When Hellmayr (1925) described *baeri* he characterised it as being overall less rufescent, especially on the dorsum, than nominate. Comparison of digital photos of the holotypes suggests that the nominate form is indeed more rufescent, at least dorsally, than *baeri*, but additional material from Mato Grosso is needed to confirm this.

What is clear from the recent collection of two females is that there is marked sexual dichromatism in at least the Paraguayan population. Within the Furnariidae very few species exhibit sexual dichromatism and all examples are subtle (Remsen 2003). Thus, the rather marked sexual differences in the amount of flammulation on the underparts of this foliage-gleaner appear to represent the extreme example of sexual dichromatism in the family. Larger sample sizes are needed to ascertain whether females are significantly smaller than males in wing and tail length.

Generic relationships of the many foliage-gleaners comprising the philydorine assemblage have long been disputed. Vaurie (1980) recommended an expanded concept of the genus *Philydor* that included, among many others, the currently recognised genera *Syndactyla* and *Simoxenops*. Although Vaurie's views failed to gain wide acceptance, the generic placement of some foliage-gleaners has shifted between *Syndactyla* and other genera, suggesting that characters used to separate these genera are not well defined. The taxon *Syndactyla mirandae* was described from Goiás, Brazil, and for a time was treated as a subspecies of *S. rufosuperciliata* before it was determined to be a synonym of *P. dimidiatum* (Remsen 2003). More recently, *Syndactyla ruficollis*, although divergent in plumage characters from the three recognised species of *Syndactyla*, was transferred to that genus from

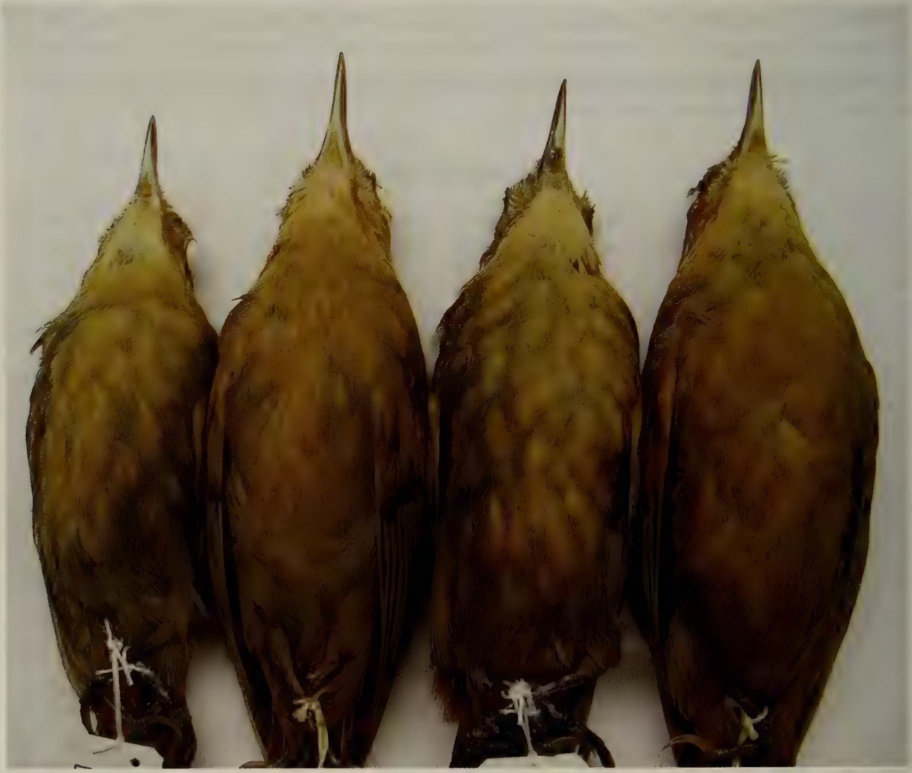

Figure 4. Ventral view of male and female *Philydor dimidiatum*. Left to right: female, KUNHM 88362; male, LACM 39956; female, KUNHM 88363; male, LACM 39957. See text for locality information. Note more pronounced flammulations on females.

Automolus, based largely on striking similarities in vocal characters (Parker *et al.* 1985, Ridgely & Tudor 1994).

Chapman (1928) erected the genus *Anachilus* (subsequently recognised as preoccupied; Chapman 1937) in describing a distinctive new furnariid from the upper río Ucayalae, Peru. In erecting *Anachilus* (=*Simoxenops*) for *ucayalae*, Chapman emphasised the large size, uniformly rufescent coloration and uniquely shaped bill as distinguishing characters. It is unlikely that Chapman compared *ucayalae* to *P. dimidiatum*, given the latter's rarity in collections. The only other member of the genus, *Anachilus* (*Simoxenops*) *striatus*, was described by Carriker (1935). He provided no specific rationale for considering it to be congeneric with *ucayalae*, commenting mainly that *striatus* was easily separated from *ucayalae* by the presence of distinct streaking on the crown, nape, mantle and chest. He also noted that the bill of *striatus* was shorter than that of *ucayalae*, and that the habits of the bird were 'much like those of *Philydor*'.

Like all *Syndactyla*, and both species of *Simoxenops*, *P. dimidiatum* has a distinctly upturned mandible, or 'ascending gonys' (Vaurie 1980, Remsen 2003). Within currently recognised *Syndactyla*, trans-Andean *ruficollis* is most similar in plumage characters to *P. dimidiatum*, both species being largely unstreaked compared to other *Syndactyla*. If *dimidiatum* were to be transferred to *Syndactyla*, then the plumage and morphological distinctions between *Syndactyla* and *Simoxenops* become even less pronounced. From a plumage perspective, nominate *dimidiatum* appears to be just a smaller version of *Simoxenops ucayalae*. Both species are rufescent in overall coloration, lack streaking, and have a pale supercilium and distinctly upturned mandible. Further blurring differences between *Simoxenops* and *Syndactyla* is that *Simoxenops striatus* is roughly intermediate in overall size and bill size between *S. ucayalae* and *Syndactyla*, and the plumage of *striatus* is as similar to *Syndactyla ruficollis* as it is to *Simoxenops ucayalae* (Remsen 2003, J. V. Remsen pers. comm.). Thus, if *Syndactyla*, *P. dimidiatum* and *Simoxenops* are considered collectively, there is a gradient in plumage and structure from the smaller billed, heavily streaked *Syndactyla* to the larger billed, unstreaked *Simoxenops ucayalae*. The extreme bill size and shape of *ucayalae*, upon which *Simoxenops* is largely based, is probably an evolutionary response to foraging specialisation on *Guadua* bamboo (Remsen 2003), and is bridged by *Simoxenops striatus* to *Syndactyla*, which shares a similarly shaped but smaller bill. *P. dimidiatum*, *Simoxenops striatus* and *Syndactyla ruficollis* similarly bridge the gap in plumage characters between the unstreaked *ucayalae* and the heavily streaked *Syndactyla*.

Vocal characters may provide the strongest argument for the relatedness of *dimidiatum* to *Syndactyla* and *Simoxenops*, and for the separation of these species from the currently recognised *Philydor*. Loudsongs of the three *Syndactyla* species represented in our inventory were remarkably uniform in pattern and note quality. Calls of these species were also strikingly similar to one another. Indeed, the vocalisations of all three species are so similar that they are easily confused by the uninitiated listener. All are united by the harsh, nasal quality of their notes (both in loudsongs and in calls), the accelerating pattern of the loudsong, the often stuttering start to the loudsong, and the variation in loudsong length, changes of pace and frequency shifts displayed by individuals, particularly in response to playback. In describing vocalisations of the various members of the genus, Ridgely & Tudor (1994) employed 'a distinctive accelerating series of harsh nasal notes, stuttering at first' for *subalaris*, and 'a series of harsh, nasal, ratchety notes which starts slowly and then speed up' for *ruficollis*. Although the fourth currently recognised species in the genus, *S. guttulata*, was not represented in our sample, published descriptions of its vocalisations are consistent with those of the other members of the genus. Hilty (2003) described the song of *guttulata* as 'a harsh, accelerating 'cjak, cjak, czak, czak-zak-zak-zak-za-za-za', sometimes followed by a few more notes', and the call as 'a harsh, rough 'chak'.' Ridgely & Tudor (1994) likened the vocalisations of *guttulata* to those of *subalaris*.

The vocalisations of *P. dimidiatum* are strikingly similar to those of the four other *Syndactyla* They have the same harsh, nasal quality to the calls and to the individual and collective notes of the loudsongs. The loudsongs typically commence with a stuttering preamble, and they show much variation in length, pace changes and frequency shifts from one song to the next in the same individual. These vocal characters are shared by both *Simoxenops*. The vocal similarities between *Simoxenops* and *Syndactyla* were first noted by Parker (1982), and have been echoed by subsequent authors (Parker & Bates 1992, Ridgely & Tudor 1994, Remsen 2003).

Conversely, the vocalisations (particularly the loudsongs) of *P. dimidiatum* are not noticeably similar to those of any of the other recognised species of *Philydor*, none of which shares the distinctive nasal quality that immediately distinguishes *dimidiatum*, *Syndactyla* and *Simoxenops*. More important, perhaps, is that our samples of other *Philydor* species (with the exception of *P. pyrrhodes*) showed no evidence of the capacity for individual variation in songs and calls that typifies *P. dimidiatum*, a seemingly ubiquitous feature of vocalisations of the various species of *Syndactyla* and *Simoxenops*. The other *Philydor* species respond to playback by giving songs and calls indistinguishable from natural (unsolicited) vocalisations, whereas *dimidiatum*, *Syndactyla* and *Simoxenops* display complex repertories that involve numerous permutations of the natural vocalisations depending on their overall degree of agitation. Also in contrast to *Syndactyla* and *Simoxenops*, the genus *Philydor* does not display great uniformity in loudsongs, and almost none in calls.

In all of its vocal characters and in its distinctly upturned mandible, *P. dimidiatum* is much more like all of the currently recognised species of *Syndactyla* than any currently recognised species of *Philydor*. In plumage characters, it is closest to *Simoxenops ucayalae*, but is also similar to *Syndactyla ruficollis* in having some flammulation on the underparts but lacking true streaking. Moreover, behaviourally, *dimidiatum* is also a closer fit with *Syndactyla* and *Simoxenops* in gleaning primarily from branch or vine surfaces, employing hammering or chiseling motions of the bill, and in often foraging apart from mixed-species flocks. The hammering or chiseling of substrates has been noted for *S. guttulata*, *S. rufosuperciliata* (Remsen 2003) and *S. ruficollis* (KJZ unpubl.), and is a primary search manoeuvre of both species of *Simoxenops* (Parker 1982, Remsen & Robinson 1988, Parker & Bates 1992, Kratter & Parker 1997, Zimmer *et al.* 1997). Conversely, this behaviour is rare (at best) or absent in *Philydor*, most species of which are dead-leaf specialists (Remsen 2003). Although all *Syndactyla* species regularly associate with mixed-species flocks, they are less habitual in their attendance than are *Philydor*, most of which are inveterate members of such flocks, and are rarely encountered away from them (pers. obs.; Remsen 2003).

Taxonomic recommendation

We recommend that '*Philydor*' *dimidiatum* be placed in the genus *Syndactyla*; the name would thus become *Syndactyla dimidiatum* (Pelzeln). Based on plumage, structural and vocal characters we also recommend that *Simoxenops* be subsumed in *Syndactyla*, which has priority. In a linear sequence *dimidiatum* should be placed between *S. ruficollis* and *Syndactyla* [*Simoxenops*] *ucayalae*. This change dictates that two scientific names be modified if *Simoxenops* is subsumed within *Syndactyla* and *dimidiatum* transferred to the latter: *Philydor dimidiatum* becomes *Syndactyla dimidiata*, and *Simoxenops striatus* becomes *Syndactyla striata*, as both specific names are variable adjectives in a new combination with a feminine genus (S. M. S. Gregory *in litt.* 2004, N. David *in litt.* 2004). A molecular-based phylogeny is required to confirm our hypotheses and to clarify relationships within the now more inclusive *Syndactyla*.

As far as is known, only birds from the type locality possess a 'russet' dorsum; over the rest of the range the dorsum is olive-brown, thus we find Ridgely & Tudor's recommendation of applying the English name Planalto Foliage-gleaner to be more appropriate than Russet-backed Foliage-gleaner.

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Special thanks to Phyllis Isler for lending her time and talent in producing the spectrograms used for this paper. Andy Whittaker and Guy Kirwan kindly shared their observations and vocal material from Minas Gerais. Greg Budney and Martha Fischer provided catalogue data for recordings deposited at the Macaulay Library of Natural Sounds, Cornell University (MLNS). We thank Kimball Garrett (Los Angeles County Museum; LACM) and John Bates (Field Museum of Natural History; FMNH) for loaned specimen material in their care. Town Peterson measured and photographed the British Museum of Natural History, Tring (BMNH) specimen, and Augusto Alves (Coleção Ornitológica do Departamento de Zoologia da Universidade Federal de Minas Gerais, DZUFMG) and Luís Fábio Silveira (Museu de Zoologia da Universidade de São Paulo, MZUSP) sent digital photographs of specimens held at these institutions. Guy Kirwan photographed those specimens held at Museo Nacional do Rio de Janeiro (MNRJ). Rob Clay provided a detailed plumage description of the male Paraguayan specimen at the Museo Nacional de Historia Natural del Paraguay (MNHNP). Arpai Nyari measured and photographed specimens at Zoologische Staatssammlung (ZSM), Munich, and access there was granted by Josef Reichholf. Ernest Bauenfeind kindly photographed and measured specimens in his care at

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APPENDIX

Recording locations and recordists. Numbers following each name represent the number of individual birds recorded by the recordist at each site.

Philydor dimidiatum.—BRAZIL: Brasília National Park, Distrito Federal (K. J. Zimmer, 5); Patas de Minas, Minas Gerais (A. Whittaker, 1). PARAGUAY: San Luis National Park (M. B. Robbins, 2, MLNS 120469–70).

Philydor ruficaudatum.—BRAZIL: Serra dos Carajás, Pará (K. J. Zimmer, 4); Alta Floresta, Mato Grosso (K. J. Zimmer, 2).

Philydor erythrocercum.—BRAZIL: Caxiuanã Forest Reserve, Pará (K. J. Zimmer, 3); Fazenda Rancho Grande, Rondônia (K. J. Zimmer, 1); rio Cristalino, Alta Floresta region, Mato Grosso (K. J. Zimmer, 3); rio Mapiá, Borba region, Amazonas (K. J. Zimmer, 1); Serra dos Carajás, Pará (K. J. Zimmer, 2). ECUADOR: Tiputini Biodiversity Station, Napo (K. J. Zimmer, 1).

Philydor erythropterum.—BRAZIL: Fazenda Rancho Grande, Rondônia (K. J. Zimmer, 3). ECUADOR: Tiputini Biodiversity Station, Napo (K. J. Zimmer, 3). PERU: Manu Wildlife Center, dpto. Madre de Dios (K. J. Zimmer, 1).

Philydor lichtensteini.—BRAZIL: Iguaçu National Park, Paraná (K. J. Zimmer, 25); Volta Velha Reserve, Santa Catarina (K. J. Zimmer, 3). PARAGUAY: dptos. Caazapá and Concepción (M. B. Robbins, 7; MLNS 120472–7).

Philydor atricapillus.—BRAZIL: Garuva, Paraná (K. J. Zimmer, 1); Iguaçu National Park, Paraná (K. J. Zimmer, 6); Ubatuba region, São Paulo (K. J. Zimmer, 5); Volta Velha Reserve, Santa Catarina (K. J. Zimmer, 2). PARAGUAY: dpto. Caazapá (M. B. Robbins; MLNS 120471).

Philydor rufum.—BRAZIL: Itatiaia National Park, Rio de Janeiro (K. J. Zimmer, 12); Augusto Ruschi Reserve, Espírito Santo (K. J. Zimmer, 1). PERU: Manu Wildlife Center, dpto. Madre de Dios (K. J. Zimmer, 1); Tambopata Research Center, dpto. Madre de Dios (K. J. Zimmer, 1).

Philydor pyrrhodes.—BRAZIL: rio Cristalino, Alta Floresta region, Mato Grosso (K. J. Zimmer, 1). PERU: Tambopata Research Center, dpto. Madre de Dios (K. J. Zimmer, 1). VENEZUELA: Yapacana National Park, Amazonas (K. J. Zimmer 1). GUYANA: (M. B. Robbins, 3; MLNS 120478–80).

Syndactyla subalaris.—COSTA RICA: Cerro de la Muerte (K. J. Zimmer, 1); Monteverde Cloud Forest Reserve (K. J. Zimmer, 10); Tapanti Faunal Reserve (K. J. Zimmer, 1). PANAMA: Chiriquí (M. B.

Robbins, 2; MLNS 120481-2). PERU: Abra Patricia, dpto. San Martín (K. J. Zimmer, 1). ECUADOR: prov. Morona-Santiago (M. B. Robbins, 2; MLNS 41285 & 41287).

Syndactyla rufosuperciliata.—BRAZIL: Itatiaia National Park, Rio de Janeiro (K. J. Zimmer, 13); Fazenda Pindobas IV, Espírito Santo (K. J. Zimmer, 2); São Francisco de Paula region, Rio Grande do Sul (K. J. Zimmer, 10); Serra do Caraça, Minas Gerais (K. J. Zimmer, 3); Serra da Graciosa, Paraná (K. J. Zimmer, 1). PERU: Cosñipata Road, dpto. Cusco (K. J. Zimmer, 2). PARAGUAY: dpto. Caazapá (M. B. Robbins, MLNS 120483).

Syndactyla ruficollis.—PERU: Abra Porculla, dpto. Piura (K. J. Zimmer, 6); Tumbes Reserved Zone, dpto. Tumbes (K. J. Zimmer, 1); ECUADOR: prov. Loja (M. B. Robbins, 1; MLNS 57080).

Simoxenops ucayalae.—BRAZIL: Alta Floresta, Mato Grosso (K. J. Zimmer, 3); rio Cristalino, Alta Floresta region, Mato Grosso (K. J. Zimmer, 4); Serra dos Carajás, Pará (K. J. Zimmer, 4). PERU: Tambopata Research Center, dpto. Madre de Dios (K. J. Zimmer, 2).

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Some taxonomic comments on the genus *Polyplectron* (Phasianidae)

by John Penhallurick & Michael Walters

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An instance of possible priority arises in relation to one of the subspecies of Grey Peacock-pheasant *Polyplectron bicalcaratum* (Linnaeus, 1758), namely *P. b. bakeri* Lowe, 1925. The type locality of Lowe's name is 'Bhutan Doars', and the current distribution of the race is north-east India, in Sikkim, Assam, Arunachal Pradesh and Bhutan. Several earlier names appear to have been available for this race when Lowe applied his name[1], specifically:

Polyplectron cyclospilum G. R. Gray, 1867. *List of the specimens of birds in the British Museum*, pt. 5, Gallinae, p. 23; and

Polyplectron enicospilum G. R. Gray, 1867. *List of the specimens of birds in the British Museum*, pt. 5, Gallinae, p. 24.

However, it appears that Lowe's separation racially of birds from north-east India and Bhutan was invalid. MPW compared skins at The Natural History Museum (NHM, Tring) of nominate *bicalcaratum* with the type of *bakeri* and could find no difference, with the characters described by Lowe unobservable in the *bakeri* skins. Both the ground colour and colour of the pale speckles in *bakeri* appear identical to those in nominate specimens. MPW also examined the types of G. R. Gray's *cyclospilum* and *enicospilum*, the type locality of which was given by G. R. Gray only as 'N. E. India', and found them to agree rather better with each other than with the type of *bakeri*. The latter has rather smaller pale speckles and some of the iridescent spots possess a short black 'tail' reaching into the white fringe, but this appears to be mere individual variation[2]. Accordingly, it seems justified to merge *P. b. bakeri* Lowe, 1925, with nominate *bicalcaratum*, and to treat G. R. Gray's 1867 names as synonyms of nominate *bicalcaratum*.

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[1] Anyone familiar with *Polyplectron hardwickii* J. E. Gray, 1830–32, *Illustrations of Indian zoology, chiefly selected from the collection of Maj.-Gen. Hardwicke*, 1: pl. 37, whose type locality is given as 'India' might wonder whether this name does not also predate Lowe's *bakeri*. However, examination of the plate makes it clear that this is an instance of *Polyplectron malacense* (Scopoli, 1786). Ogilvie-Grant (1893, *Catalogue of the birds of the British Museum* 22: 259) correctly gives the type locality of *P. hardwickii* and *P. lineatum* J. E. Gray, 1829, as 'Malacca' (the locality of the latter being given by Gray as 'China').

Given the level of individual variation within *P. bicalcaratum*, we checked specimens of other races of the species. An examination by MPW of the type of *bailyi* Lowe, 1925, whose range is given by Madge & McGowan (2002) as 'E Himalayas (probably NE India but locality of specimens uncertain)', revealed none of the differences listed by Lowe. Specimens in the NHM collection identified as *ghigii* Delacour & Jabouille, 1924, whose distribution to quote Madge & McGowan (2002) is 'C Laos and N and C Vietnam', were also examined. Again, no difference could be found in either ground colour or that of the speckles. The distinction Delacour & Jabouille (1924) make concerning the ocelli appears in some specimens but not in others, thus suggesting again that these are matters of individual variation alone, and leading us to propose that *Polyplectron bicalcaratum* (Linnaeus, 1758) be treated as monotypic.

References:

Delacour, J. & Jabouille, P. 1924. [Twelve new species and subspecies from French Indochina]. *Bull. Brit. Orn. Cl.* 45: 28–35.

Lowe, D. 1925. Some notes on the genus *Polyplectron*. *Ibis* (12) 1: 476–484.

Madge, S. & McGowan, P. 2002. *Pheasants, partridges and grouse*. Christopher Helm, London.

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[2] The copy of G. R. Gray (1867) at Tring is interleaved and annotated, probably by Sharpe, and these annotations equate G. R. Gray's *cyclospilum*, *enicospilum* and *atelospilum* with '*thibetanum*', presumably *Polyplectron thibetanum* Hume & Davison, 1878, *Stray Feathers* 6: 432, 521 (north and central Tenasserim). Since the latter name is now synonymised with nominate *bicalcaratum*, this seems further reason to synonymise *bakeri* with nominate *bicalcaratum*.

The subspecific status of Sardinian Warblers *Sylvia melanocephala* in the Canary Islands with the description of a new subspecies from Western Sahara[1]

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Sardinian Warbler *Sylvia melanocephala* is a circum-Mediterranean species with three recognised subspecies (Shirihai *et al.* 2001): *S. m. melanocephala* (S. G. Gmelin, 1789) in southern Europe, the Mediterranean, western Turkey, north-west Africa and Libya, including those from the Canary Islands which were formerly recognised as *leucogastra* (Ledru, 1810); *S. m. momus* (Hemprich & Ehrenberg, 1833) in Syria, Israel and Sinai; with the extinct *S. m. norrisae* Nicoll, 1917, restricted to the oasis of Faiyum in Egypt (Roselaar *in* Cramp 1992). Records from the oases of the central and southern Sahara, and the Sahel, are of migrants or wintering birds (Heim de Balsac 1932, 1951, Niethammer & Laene 1954).

Here we propose that the name *leucogastra* be restored for those birds in the Canaries, despite not being recognised by Shirihai *et al.* (2001), who included these birds within the nominate. They display a series of characteristics that, in combination, separate them from other recognised subspecies, although even within the Canaries variation in plumage and coloration, linked to certain geographical factors, is identifiable (Roselaar *in* Cramp 1992). Consequently, subspecific status for Sardinian Warblers from the Canaries was questioned by Vaurie (1954, 1958), although not by Williamson (1968) or Roselaar *in* Cramp (1992). Furthermore, we describe a new subspecies from Western Sahara, based on five specimens whose mensural data and plumage differ from all other currently recognised subspecies. Finally, we discuss some taxonomic aspects of the subspecies found in the western and eastern parts of the species' range.

Methods

Our work is based on mensural data and an examination of plumage features in museum specimens, namely: 29 and 55 *S. m. melanocephala* from Morocco and Iberia, respectively; 32 *S. m. leucogastra* from the Canaries (Fuerteventura, Lanzarote, Gran Canaria, Tenerife and La Palma); 36 *S. m. momus* from Israel, Egypt, Libya, Jordan and Syria; and nine of the extinct *norrisae* from Faiyum,

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[1] The new taxon described here is more or less endemic to the area commonly known as 'Western Sahara'; however, our use of this term does not imply any implicit recognition or not of the international validity of the area's boundaries.

Egypt. The plumage of all other Sardinian Warbler specimens (several hundred) in the collection of the Natural History Museum (NHM), in Tring, was also examined. The following measurements were taken: 1) bill-length to skull; 2) bill depth at the base; 3) maximum wing-chord; 4) distance between the tips of p10 and the longest primary-covert; 5) distance between the tip of p10 and the wingtip; 6) distance between the tip of p7 and the wingtip; 7) tail-length; 8) the roundness of the tail based on the distance between the tips of the outermost and central rectrices; 9) tail–wing ratio; and 10) tarsus-length. Culmen-length, bill depth and tarsus-length were measured with callipers to the nearest 0.01 mm. Wing-length was measured straightened and flattened against a ruler to the nearest 0.5 mm; tail-length from the base to the distal extreme; and the distances between feather tips were measured against a ruler to the nearest 0.5 mm.

ANOVA and Statistical Discriminant Analysis were applied to birds grouped according to subspecies to establish the potential existence of morphometric differentials between these groups. The nominate subspecies was represented by resident birds from Morocco and Iberia, although birds from these areas were treated separately because they differ somewhat in plumage and measurements. Morphological similarities between subspecies were calculated by means of the Mahalanobis distance, a measure of the distance between the centroid of a cluster of factors characterising each subspecies (as determined by measurements) within a multi-dimensional space. The lower the distance between groups the greater morphological similarity; larger distances indicate fewer morphological similarities.

The new subspecies from Western Sahara is represented by four males (a juvenile, 15 May 1955; a first-year, 26 November 1972; a second-year and adult, 17 April 1955) and a female (adult, 3 May 1955), all housed in the Estación Biológica de Doñana (EBD), in Seville.

Revalidation of *S. m. leucogastra*

Williamson (1968) and Roselaar *in* Cramp (1992) considered *S. m. leucogastra* valid on the basis of its smaller size as compared to nominate populations, different markings and coloration (e.g. less white on the inner webs of the outer tail-feathers), rounder wing and different repertoire of rattling nasal calls. Nevertheless, birds from the Canaries display varied plumages, measurements and structure that are linked to geographical factors. Roselaar *in* Cramp (1992) and Shirihai *et al.* (2001) concluded that such variation is due to ongoing differentiation processes occurring within each subpopulation. One of the most significant is in the coloration of birds from the western Canaries, which is darker compared to birds from the eastern islands; clinal gradients even exist within islands (Roselaar *in* Cramp 1992). Size differences between islands are more complex and a representative study is much needed.

Morphometrics

Despite intra-group variation, birds from the Canaries represent a discrete morphometric group (ANOVA; F (5.125); *P*<0.0001) separable from all other subspecies (Statistical Discriminant Analysis; F (45.526); *P*<0.001). In general, those from the Canaries have shorter, more rounded wings, and larger body measurements—tarsus- and culmen-lengths and tail–wing ratio—than other subspecies. Other than birds from the Sahara, they also have comparatively less-rounded tails (Table 1). The Mahalanobis distances (Table 2) indicate that of all the other subspecies, *norrisae* is mensurally closest to *leucogastra*. Most of the body measurements are similar in both subspecies (Table 1) and thus, in terms of the Mahalanobis distances, these two subspecies are close. Nevertheless, there are differences between the two taxa in bill- and tail-lengths, which are greater in *leucogastra* than in *norrisae* (Table 1). The similarity in morphological appearance between *norrisae* and *leucogastra* was remarked by Roselaar *in* Cramp (1992) and these subspecies, along with *melanocephala* from Iberia, are somewhat distant from *melanocephala* from Morocco and birds from the Sahara. On the other hand, *momus* is clearly even more distant.

Plumage

At least two plumage types have been detected: pale and dark. Pale birds have very white underparts and are found on Fuerteventura, Lanzarote and Gran Canaria (the three eastern islands). They recall birds from North Africa (in Morocco, Algeria and Tunisia) and are likewise pale on all of their underparts, lacking any beige or even any slightly reddish tones, and have paler grey upperparts than European birds. The darkest upperparts and underparts (these are slightly beige-coloured) are from Tenerife and La Palma (in the western Canaries; note that none was examined from El Hierro or La Gomera). These plumage types and their relationship to geographical factors were described by Roselaar *in* Cramp (1992).

The considerable variation in some body measurements (see Table 1) and relationship between plumage coloration and geographical factors corroborate the existence of a population complex in the Canaries, as noted by Roselaar *in* Cramp (1992). Within this complex two further trends exist, as documented for other pairs or groups of taxa from the Canaries, namely Common Kestrel *Falco tinnunculus canariensis* and *F. t. dacotiae*, Stone Curlew *Burhinus oedicnemus insularum* and *B. o. distinctus*, Great Spotted Woodpecker *Dendrocopos major canariensis* and *D. m. thanneri*, Chaffinch *Fringilla coelebs* ssp. and Blue Chaffinch *Fringilla teydea*, Blue Tit *Parus caeruleus* ssp., etc., as a result of chronologically different invasions. For Sardinian Warbler, the dark forms probably originate from African populations that occupied the more humid western Canaries during periods of wetter, warmer climate. Likewise, paler populations (closer to present-day North African birds and clearly different from those in Europe) in the drier eastern islands probably originate from more recent colonisation events during the present drier climatic period.

Shirihai *et al.* (2001) recognised this process of differentiation between islands and called for further studies. Nevertheless, they did not take into account the features that separate all Canarian birds from other forms and proposed that they be included within the nominate based on single birds from Lanzarote and southern France with identical sequences in their mitochondrial cytochrome-*b* gene. However, the very low mutation rate of this genetic marker—less than 2% per one million years (Haring *et al.* 1999, García-Moreno *et al.* 1999)—means that it is somewhat less than ideal for work at lower taxonomic levels. Thus, processes of taxonomic differentiation could have taken place (e.g., only a few tens of thousands of years ago during the most recent ice age) without any mutation or fixation in the base sequence of cytochrome *b*. Other genetic markers with greater mutational rates are more valid in such cases (Haring *et al.* 1999). Furthermore, Shirihai *et al.* (2001) sequenced mtDNA from just one bird without specifying whether it was resident or possibly a wintering or migrant individual.

We propose that the subspecific status of *leucogastra* be provisionally restored for all Canarian birds as per Roselaar *in* Cramp (1992) and Williamson (1968), based on its characteristic plumage and morphometrics that separate it from all other subspecies. Nonetheless, a definitive study of the relationship between populations in the Canaries and North Africa (resident Moroccan, Algerian and Tunisian birds) is still needed, including data on body weight and total length, sonograms of songs and calls, and DNA analysis, all of which are beyond the scope of the present contribution.

The appearance of Canarian specimens, apart from measurements, strongly indicates that possibly three populations are involved: smaller dark birds from La Palma (and perhaps elsewhere); larger, dark or intermediate birds on Tenerife; and paler birds, apparently identical to the resident Moroccan population, on the three drier easternmost islands (Gran Canaria, Fuerteventura and Lanzarote). North African birds and the latter population might easily be considered a separate subspecies, but for now we propose to retain *leucogastra* for all Canarian populations and leave resident North African populations in nominate *melanocephala*, with the exception of a new form from the Western Sahara that we propose to name as follows.

***Sylvia melanocephala valverdei* subsp. nov.**

Holotype EBD 19599A, adult female, collected at El Aium de Saquiat (27°10’N, 13°12’W), Western Sahara, on 3 May 1955, by J. A. Valverde.

Paratypes EBD 19594A, first-year male, collected at Tumbas de Edam (23°49’N, 15°52’W), 20 km from Villa Cisneros, Western Sahara, on 26 November 1972, by J. A. Valverde. Weight 12.5 g and gonads undeveloped. Two other males (EBD 19595A, 19596A) are from Sebja Imlilik (23°14’N, 15°56’W), Western Sahara, and were taken on 17 April 1955. Both have developed gonads, and the first is in second-year plumage and the other adult. A juvenile (EBD 19598A), taken on 5 May 1955 is from El Aium de Saquiat (27°10'N, 13°12'W), Western Sahara. All were collected by J. A. Valverde.

Description of holotype Crown and head-sides uniform brown suffused pale grey; crown feathers with dark grey-brown bases; nape, neck-sides, mantle, back and rump uniform sandy brown, somewhat paler on rump and uppertail-coverts, and darker on ear-coverts; wing-coverts as back; underparts (chin, throat and foreneck) off-white, breast and central belly pale cream, and breast-sides, flanks, thighs, vent and undertail-coverts pale beige. Primaries and upper surface of secondaries grey-brown with pale fringes and tips; alula similar, but with broader pale fringes. Underside of secondaries, underwing-coverts and axillaries buff-brown, almost imperceptibly tinged pink. Uppertail brown, the outermost rectrices having a pale cream outer web and distal third of inner web, grading into brown of feather base; second outermost rectrices brown with a pale cream distal spot *c*.5 mm in diameter and third outermost similar but with a small spot *c*.2 mm in diameter at tip. Bare parts (as noted by the collector): upper mandible dark brown; distal half of lower mandible dark brown and basal half pale yellow; tarsus and toes yellow-brown.

Description of paratypes Crown, head-sides and ear-coverts matt black with some (3–4) juvenile feathers on pileum; rest of upperparts greyish brown, slightly paler on rump and uppertail-coverts; underparts largely white, becoming off-white on breast and belly, and breast-sides and flanks pale grey. Flight-feathers brown, with pale outer webs; alula dark brown with contrasting broader off-white outer webs; underwing-coverts and axillaries pale grey, and underside to secondaries pinkish cream. Uppertail darker with outer web and distal third of inner web of outermost pair white; second outermost pair has distal two-thirds white, the rest dark; three outermost rectrices have a small white mark at tip (all three are retained juvenile feathers). Bare parts: upper mandible uniform dark brown; lower mandible brown with base and cutting edges paler; legs and toes yellowish brown.

Diagnosis Both sexes have bill, wing and tail shorter, tail less rounded and tarsus longer than nominate from North Africa and Iberia (Table 1). Similar in size to *melanocephala* and *leucogastra*; *momus* is smaller and has a shorter tail.

Adult male has cap similar to nominate and *leucogastra*, but matt black, not glossy as in *melanocephala*. Upperparts pale greyish brown with olivaceous tone in some. Overall, noticeably paler (Fig. 1) lacking dark lead grey tones of *melanocephala* and *leucogastra*, or brown suffusion of most *momus* (also present in some male *norrisae*). Primaries and secondaries blackish brown with greyish-brown fringes; pattern on outer rectrices similar to that in *melanocephala* and *leucogastra*; innermost rectrices blackish brown with pale greyish-brown fringes; overall, rectrices and remiges blackish brown like *momus*/*norrisae*, not blackish grey as *melanocephala* and *leucogastra*; inner webs of secondaries clearly greyish

TABLE 1

Mean values of body measurements among studied groups of *Sylvia melanocephala*. Bill-length; bill depth = height of bill at base; wing-length; p10–pc = distance between tip of p10 and longest primary-covert; p10–WT = distance between tip of p10 and wingtip; p7–WT = distance between tip of p7 and wingtip; RD = distance from tip of central tail-feathers to tip of outermost tail-feathers; tail–wing = ratio tail-length/wing-length; and tarsus length. Figures in brackets relate to number of individuals. (I) = Iberia; and (M) = Morocco.

	Bill			Bill depth			Wing			p10–pc			p10–WT			p7–WT			Tail			Roundness			Tail/Wing			Tarsus		
	X	SD	N	X	SD	N	X	SD	N	X	SD	N	X	SD	N	X	SD	N	X	SD	N	X	SD	N	X	SD	N	X	SD	N
S. m. melanocephala (I)	13.33	0.55	50	3.20	0.14	54	59.65	1.89	52	4.49	1.10	52	30.76	1.74	52	0.31	0.41	52	60.67	2.91	47	10.00	2.03	45	0.94	0.28	51	19.54	0.82	52
S. m. melanocephala (M)	13.14	0.40	28	3	0.17	28	58.90	1.19	29	4.24	1.57	27	31.17	1.79	27	0.49	0.46	27	57.21	6.01	27	10.68	2.53	27	0.91	0.27	29	19.57	1.17	29
S. m. valverdei	12.84	0.53	5	3	0.16	5	58.02	0.94	5	3.64	0.68	5	30.58	1.03	5	0.46	0.11	5	55.96	1.13	5	7.04	1.20	5	0.96	0.02	5	19.64	0.52	5
S. m. leucogastra	13.52	0.96	29	3.15	0.18	18	56.64	2.03	32	5.88	1.24	30	28.51	1.97	30	0.68	0.70	32	58.26	2.12	32	8.40	1.74	31	1.03	0.04	32	19.94	1.03	32
S. m. norrisae	12.72	0.43	9	3.03	0.16	9	56.76	0.83	9	6.54	1.29	9	28.68	1.87	9	0.58	0.66	9	56.28	2.64	9	8.43	1.80	9	0.99	0.04	9	19.79	0.74	9
S. m. momus	12.41	0.63	24	2.97	0.18	21	55.42	1.96	27	4.46	1.33	27	29.42	1.69	26	0.25	0.40	26	54.01	2.02	25	8.54	1.19	25	0.90	0.26	27	19.27	1.11	27

brown, not pale grey as *melanocephala* and *leucogastra*. Throat and breast pure white, lacking the almost imperceptible creamy tinge of *momus* (even rosy in some *momus* and most *norrisae*); lacks grey wash on throat and upper breast of Iberian *melanocephala*, whilst Moroccan *melanocephala* is noticeably white like *leucogastra*. Breast-sides and flanks grey as most *momus* (lacking the buff-pinkish cast of most *norrisae* and some *momus*), albeit more intense and extending nearer central breast than in *melanocephala* and *leucogastra*; lower breast and belly uniformly pure white (the collector recalls a pinkish flush in fresh plumage), lacking the buff tones of *momus* (in Iberian *melanocephala* white restricted to central lower breast and belly) and lacking diffuse grey of *leucogastra*; dark areas on flanks smaller and paler than in *melanocephala* and *leucogastra*; greyish-white thighs, not ash-grey of *melanocephala* and *leucogastra*, and whiter than *momus* becoming buff-coloured closest to tibia, not dark brown as in *melanocephala*, chestnut of *leucogastra* or sandy in *momus*/*norrisae*. Undertail-coverts pure white, lacking pinkish tone of *momus*/*norrisae* or grey of *melanocephala* and *leucogastra*; tail-feathers broader and more rounded than in *momus*.

Adult female has crown and head-sides sandy brown almost imperceptibly washed grey, but no marked contrast with rest of upperparts. Neck-sides, nape, mantle, wing-coverts, back and rump pale brown, not deep olivaceous brown as in Iberian *melanocephala* (greyer in the Maghreb) and *leucogastra*, or sandy brown as in *momus* (*valverdei* has palest upperparts of all subspecies and populations examined); flight-feathers and rectrices as male; white throat as *momus*/*norrisae*, *leucogastra* and *melanocephala* (Maghreb), but Iberian *melanocephala* off-white. Underparts creamy white, more sandy on flanks, unlike buffish breast and flanks of *momus* or off-white central underparts and greyish flanks of *leucogastra* and *melanocephala* from the Maghreb. Iberian *melanocephala* has much darker

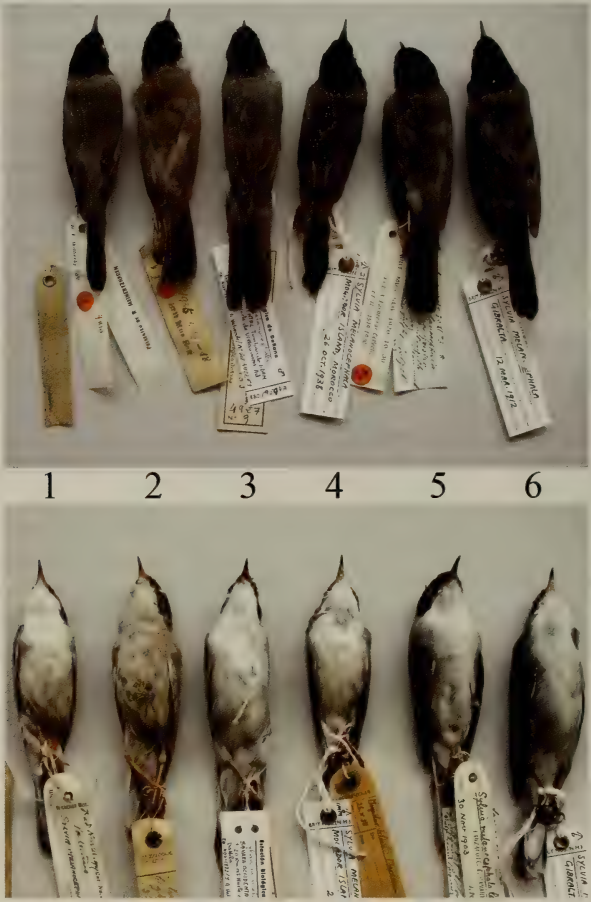

Figure 1. Dorsal and ventral views of males of *Sylvia melanocephala*: (1) *S. m. momus* (grey form, NHM 1934.1.1.4810; Jericho, Palestine, November); (2) *S. m. norrisae* (rufous form, NHM 1935.1.15.18; Egypt, March); (3) *S. m. valverdei* (EBD 1959.4A; adult, Dakhla, Western Sahara—under Moroccan administration, November); (4) *S. m. melanocephala* (NHM 1965H.13.990; Essaouira, Morocco, October); (5) *S. m. leucogastra* (NHM 1920.10.30.57; Lanzarote, Canaries, November); and (6) *S. m. melanocephala* (NHM 1965M.19.003; Gibraltar, March).

TABLE 2

Mahalanobis distance values among studied groups of *Sylvia melanocephala* according to body measurements. (I) = Iberia; and (M) = Morocco.

	melanocephala (I)	*melanocephala* (M)	*valverdei*	*leucogastra*	*norrisae*	*momus*
melanocephala (I)	0	1.95	5.22	5.28	9.60	13.99
melanocephala (M)	1.95	0.00	5.27	6.43	7.62	9.23
valverdei	5.22	5.27	0.00	6.61	8.08	7.18
leucogastra	5.28	6.43	6.61	0.00	4.88	12.19
norrisae	9.60	7.62	8.08	4.88	0.00	5.27
momus	13.99	9.23	7.18	12.19	5.27	0.00

underparts. Overall, distinctly more sandy brown and paler than female *melanocephala* and *leucogastra*, and less rufous than *momus*.

Juvenile is similar to adult female and is the palest of all forms. Upperparts sandy brown; throat and central belly white; upper breast buff, darker brown on sides; remiges and tail brown with pale buff fringes. The only available specimen of *S. m. norrisae* has a paler, rufous-brown back, and white underparts with flanks and breast suffused buff (Roselaar *in* Cramp 1992). *S. m. momus* is slightly more rufous than *valverdei.* Closer in coloration to Canarian individuals. *S. m. melanocephala* is darker grey olive-brown above with a greyish breast and darker olive-grey sides; remiges and rectrices black.

Measurements

S. m. valverdei is separated morphometrically from all the other groups: ANOVA; F (5.125); *P*< 0.0001; discriminant analysis F (45.526); *P*<0.0001. Individually, all body measurements except tarsus (*P*<0.3) show significant values (*P*<0.01). The Mahalanobis distances (Table 2) locate *S. m. valverdei* closer to *S. m. melanocephala* from Iberia and Morocco and *leucogastra* than to *norrisae*, and it is clearly distant from *momus*. *S. m. valverdei* has a more square-ended tail and the smallest distance of all subspecies between the tips of p10 and the longest primary-covert. Structurally, *valverdei* has a proportionately longer tarsus than nominate from Iberia and Morocco, which have broader bills, and longer bills and tails. *Valverdei* is similar to *norrisae*, with a longer and more rounded tail, and slightly shorter wings and bill. However, it contrasts with *leucogastra*, which has a larger and more robust bill and tarsus, and shorter more rounded wings. Overall, *valverdei* is noticeably larger than *momus* (Table 1).

S. m. valverdei is a well-defined form with plumage structure and morphometrics that differ from all other subspecies. The specimens of *valverdei* studied by us are from the coastal region of Rio de Oro and Saquiat Al-Hamra, in the north and south of Western Sahara, respectively; no cline is apparent.

Etymology We take pleasure in recognising the work of José Antonio Valverde who discovered this form, collecting both the holotype and paratypes. The founder of the Doñana Biological Station and Doñana Biological Reserve and its scientific collection, Valverde produced many works of zoological interest, including one on the birds of Western Sahara (former Spanish Sahara).

Distribution From southern Morocco (Tiznit) along the Anti-Atlas coastline as far as Taghjicht and Jbel Guir, thence upstream along the Oued Draa to Guelta Zerga, and on the Western Saharan coast in a 50 km-wide strip as far as the Tropic of Cancer. Heim de Balsac & Heim de Balsac (1954) considered the species to be an indicator of the modifying influence of the Atlantic on desert environments. Valverde states that it may breed in stands of *Tamarix* in the Adrar, in Mauritania, and those seen in parts of northern Mauritania and thought to be migrants may be resident; the same author also believed that it might occur in neighbouring Algeria. Heim de Balsac (1930) collected one (unsexed) bird in March at Chenachane (26°0'N, 00°15'W), south-east Algeria, 900 km east of the paratype region. Owing to its intermediate plumage between male and female and its smaller size than the nominate, its identity was not ascertained. Valverde (1957) doubted that Sardinian Warbler breeds in this part of Algeria given its arid nature and the lack of suitable habitat. In Western Sahara, Sardinian Warbler occurs continuously from the north as far south as Cap Bojador, at which point *Rhus* scrub formations disappear; further south only scattered pockets of such habitat survive.

Habitat According to Valverde (1957), Sardinian Warbler occurs in three habitats in Western Sahara: in *Euphorbia* and *Opuntia inermis* formations; clumps of *Tamarix* and *Nitraria* mixed with *Salicornia*; and in 'graras' of the coastline around Dora and Aium. 'Graras' are depressions where soils give rise to thickets of vegetation growing in concentric circles—due to the moisture gradient of the soils—in the following order (outermost first): *Euphorbia*, saltworts, *Rhus* and grasses in the centre. Sardinian Warbler is the most constant and abundant species in such habitat in Western Sahara (Valverde 1957).

Breeding Heim de Balsac & Heim de Balsac (1954) commented that breeding activity peaks in April–May. Valverde (1957) mentioned that females were incubating in mid April, that chicks fledge early June and that by mid June the season is over.

Taxonomy of North African populations of *Sylvia melanocephala*

Separation of Iberian and North African populations of *S. m. melanocephala*

The Iberian population is very uniform in size and plumage within each sex and age category throughout its range. No clinal size variation was detected from north to south Spain. Clear differences are visible between birds from southern Iberia and northern Morocco. In terms of plumage coloration and biometrics, both populations accord with birds from the rest of Iberia and North Africa, respectively.

The resident North African population is also very uniform. Males have purer grey upperparts (paler than Iberian birds) and, above all, very white throat, breast, belly and vent, with grey flanks (Fig. 1). Upperparts in females are clearly less brown (being greyer), and, like males, also have predominantly very white underparts, with grey flanks, that also differ from Iberian populations. Specimens from Tunisia, Algeria and Morocco (as far as Essaouira) are similar to *leucogastra* from the eastern Canaries.

Momus/norrisae complex

Momus and *norrisae* show common, well-defined plumage and morphometric features that separate them from all other recognised subspecies, suggesting that they have attained allospecies status and that further study is necessary to clarify the precise differences between them (Shirihai *et al.* 2001). Plumage features indicate that *momus* and *norrisae* are closely related and separate from other North African forms. *Momus* displays obvious variation in coloration, although to what extent is not known in detail. Birds with both grey and with sandy backs appear, although far more males with grey backs are available in NHM (Fig. 1), agreeing with the typical description of this subspecies, and fewer with warmer, sandy tones (regardless of the state of wear). Roselaar *in* Cramp (1992) mentions that in *momus* male upperparts are dark or medium grey in fresh plumage and in first-years the upperparts are tinged grey-brown. Nevertheless, we have found both types of coloration in fresh-plumaged males older than one year. Specimens of *norrisae* in NHM, all males, have variable coloration, although birds with sandy backs, some even with reddish tones (Fig. 1), outnumber those with grey backs. The type specimen has a grey back. In direct comparison, the plumage of birds of both subspecies, either within sandy/reddish-backed individuals or within greyish-backed ones, is otherwise quite indistinguishable.

Morphometric analysis and the data in Table 1 show that *momus* is very different from North African populations both in size and structure. Likewise, the morphometric proximity (Table 2) of *momus* and *norrisae* compared to other groups is also evident.

Like Shirihai *et al.* (2001), we believe that *Sylvia melanocephala* should be considered a superspecies comprising two allospecies, *S. melanocephala* and *S. momus/norrisae*, in line with the other examples given by the same authors in their recent monograph of the genus *Sylvia*.

We conclude that both populations belong to a single form, *momus*, and that *norrisae* is not 'a highly characteristic' form, as stated by Shirihai *et al.* (2001), given that the only available (small) sample of males possesses similar colour variation to *momus*. Slight morphometric differences between *momus* and *norrisae* coincide with those found between *valverdei/leucogastra* and *melanocephala* and are doubtless related to the more isolated and sedentary character of the populations in the Canaries, coastal Sahara and Faiyum oasis. The consistency of *norrisae* as a subspecies distinct from *momus* is much more questionable than that of *leucogastra* with respect to *melanocephala* from Europe, North Africa and Anatolia.

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In *Bull. Brit. Orn. Cl.* 125 (1), on p.73 the Y (vertical) axis label was 'masked' and the notations 'CD' and 'RSS' within the figure should read 'CB' and 'RSA' respectively. Y data positively correlated bill against wings and tail, and X data positively correlated wing, bill and tail. In Figure 7, on p.74, the X and Y data are the same as in Figure 6, and the Z data are positively correlated with wing and tail and negatively correlated with bill.

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For instructions on style, see the inside rear cover of Bulletin 125 (1) or the BOC website
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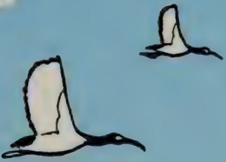

Volume 125 No. 4
December 2005

MEETINGS are normally held in the **Sherfield Building** of **Imperial College**, South Kensington, London SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. (Limited car parking facilities can be reserved [at a special reduced charge of **£5.00**], on prior application to the Hon. Secretary.)

The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm.** (A vegetarian menu can be arranged if ordered at the time of booking.) Informal talks are given on completion, commencing at about 8.00 pm.

Dinner charges are **£20.00** as from **1 January 2005.**

FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

6 December 2005—Dr Julian Hume—*The parrots of the Mascarenes*

The Mascarenes (Réunion, Mauritius and Rodrigues) are isolated volcanic islands in the south-west Indian Ocean; due to numerous sea-level changes, bird colonists were able to island-hop to the Mascarenes within the last 5–7 million years from South-east Asia. Using this route, at least 3–4 parrot colonising events took place, with Mauritius and Réunion harbouring three or four sympatric species and Rodrigues two. However, due primarily to man's interference, all of the Mascarene parrots are now extinct bar the Echo Parakeet *Psittacula echo* of Mauritius, and sadly, this species too, is in grave danger of extinction. From an artistic background, Julian Hume returned to academia and studied the vertebrate paleontology of the Mascarenes for a Ph.D., publishing a number of relevant papers as a result. Present projects include a book on the ecological history of the Mascarenes and he was recently awarded a large research grant by the Linnean Society to study the palaeontological history of Aldabra, in the Indian Ocean.

*Applications to Hon. Secretary (address below) by **22 November** please*

24 January 2006—Field Marshal Sir John Chapple GCB, CBE, DL—*Reminiscences of a nature conservationist*

Combining a distinguished military career with a life-long interest in natural history, Sir John will reminisce about some of the numerous wild places he has visited, including Malaysia and Borneo. More recently, he has been involved in conservation issues in Nepal where a captive breeding programme for local vultures is being developed. He is a Trustee of the King Mahendra Trust, a charity committed to 'ensuring a balance between human needs and the environment to guarantee long-term sustainability' (in Nepal). Sir John is associated with numerous wildlife enterprises and as a past president of the Zoological Society of London, a member of the Council for the World Wildlife Fund and President of the Army Ornithological Society, he remains committed to many aspects of nature conservation.

*Applications to Hon. Secretary (address below) by **10 January** please*

Future meetings in 2006—provisional dates for meetings in 2006 have been set for the following Tuesdays:
14 March, 25 April (and AGM), 6 June, 7 November and 5 December. **Speakers to be announced.**

Overseas Members visiting Britain are especially welcome at these meetings, and the *Hon. Secretary* would be very pleased to hear from anyone who can offer to talk to the Club, in 2006, giving as much advance notice as possible—please contact: S. A. H. (Tony) Statham, Ashlyns Lodge, Chesham Road, Berkhamsted, Herts. HP4 2ST, UK (or e-mail: boc.sec@bou.org.uk).

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CLUB ANNOUNCEMENTS

R. S. R. (Richard) Fitter 1913–2005

The Club notes with sadness the death on 3 September 2005 of one of its longest-serving members (and Honorary Life Member), the noted author and naturalist, Richard Fitter. He served on the committee in 1959–62, was Vice-Chairman in 1962–65 and Chairman in 1965–68. His series of identification guides was among the first and best of their genre, and included the *Collins pocket guide to British birds* in 1952. Richard Fitter had a wide interest in natural history, received several awards and served on many bodies including the World Wildlife Fund and British Trust for Ornithology.

Members are reminded that revised arrangements for membership correspondence, subscriptions and applications can be found on the inside back cover of this issue. All membership issues should now be addressed to the BOC Office, P. O. Box 417, Peterborough PE7 3FX, UK. E-mail: boc.office@bou.org.uk

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The 929th meeting of the Club was held on Tuesday 15 March 2005, in the Sherfield Building Annexe, Imperial College, London. 26 members and 7 guests were present.

Members attending were: Dr C. F. MANN (*Chairman*), Miss H. BAKER, I. R. BISHOP, Mrs D. M. BRADLEY, D. R. CALDER, Cdr. M. B. CASEMENT, Ms K. COOK, Dr R. A. F. COX, F. M. GAUNTLETT, Revd. T. W. GLADWIN, D.GRIFFIN, J. P. HUME, R. R. LANGLEY, D. J. MONTIER, Mrs M. N. MULLER, R. C. PRICE, Dr R. P. PRŶS-JONES, P. SELLAR, S. A. H. STATHAM, C. W. R. STOREY, Dr D. H. THOMAS (*Speaker*), M. J. WALTON, Cdr. F. S. WARD, R. P. WEBSTER and P. J. WILKINSON.

Guests attending were: Ms G. BONHAM, Mrs J. CALDER, Mrs M. H. GAUNTLETT, Mrs J. M. GLADWIN, Mrs M. MONTIER, C. MULLER and Mrs M. THOMAS.

After dinner, Dr David Thomas gave an interesting talk on *The shady life of birds*. In hot conditions (where animals must offload heat) they use shade. The easy assumption is that this simply shields them from the sun's heat, but many birds use the shade more subtly than this. In several locations I have noticed that ground-living birds of several species use the shade's edge rather than its centre. This appears to achieve two effects: it shields the birds from direct solar heat loading, and (more subtly) it maximises their exposure to a clear sky, which is the best heat sink available to which the birds can lose heat by radiation. I tested this hypothesis in northern Kenya, where a pair of Black-faced Sandgrouse *Pterocles decoratus* shaded themselves under an *Acacia reficiens* shrub. Around midday, air temperatures were 33°C where the birds had been, and the radiant temperatures of the shrub canopy, shaded soil and soil in sun flecks were 25°C, 36°C and 39°C respectively. Assuming the birds' radiant temperatures were like that of shaded soil (*c*.35°C), only the shrub canopy would have provided a heat sink for radiative heat loss, but the temperature difference driving this (10°C) was small and heat loss via this route would have been correspondingly slow. However, the radiant temperature of the sky varied between +13°C at 15° elevation above the horizon to –6 to –7°C at 60–90° elevation. Thus, the closer the birds were to the edge of the shade, the lower the sky temperatures they experienced, and the larger the temperature difference (up to 40°C) they experienced to drive radiative heat loss. Since evaporation of body water is the only other significant route for losing body heat loads under such circumstances, maximising radiative heat loss has an obvious economic advantage, for negligible energy cost.

The 930th meeting of the Club was held on Tuesday 26 April 2005, in the Sherfield Building Annexe, Imperial College, London following the Annual General Meeting. 24 members and 5 guests were present.

Members attending were: Cdr. M. B. CASEMENT (*Chairman*), Miss H. BAKER (*Vice-Chairman*), I. R. BISHOP, Prof. R. A. CHEKE, N. CLEERE, Ms K. COOK, Dr J. COOPER, J. B. FISHER, F. M. GAUNTLETT, D. GRIFFIN, C. A. R. HELM, J. P. HUME, K. N. IDDI, G. M. KIRWAN, R. R. LANGLEY, Dr C. F. MANN, D. J. MONTIER, Mrs M. N. MULLER, A. J. PITTMAN, Dr D. E. POMEROY, Dr R. P. PRŶS-JONES, P. SELLAR, S. A. H. STATHAM and Cdr. F. S. WARD

Guests attending were: Ms G. BONHAM, Mrs C. CASEMENT, Mrs B. FISHER, Mrs M. H. GAUNTLETT and Mrs M. MONTIER.

After dinner, Members gave a series of short talks on subjects of topical interest; the following is a brief synopsis of the main points presented.

Robert Prŷs-Jones presented a short paper on *The ornithology of the other Captain Cook*. Captain Samuel Edward Cook (later Widdrington), 1787–1856, was an important figure in early Spanish ornithology, whose major written contribution to the subject came in the form of a chapter in his 1834 book *Sketches in Spain*. By career a naval officer, he was memorably described by a contemporary writer on travel in Spain, Richard Ford, as 'a great geologist and stuffer of little birds and stalker of fat women'. He is now much overlooked, being perhaps best remembered through the scientific name *Cyanopica* (*cyanus*) *cooki*, the Iberian form of the Azure-winged Magpie described by Prince Bonaparte in 1850 from a specimen collected by Cook. This and a few other of his specimens are held in The Natural History Museum bird collections in Tring, and the data associated with a couple of them present interesting problems in interpretation. However, the whereabouts of most birds that he collected, including some formerly in the museum of the Zoological Society of London prior to its break-up in the 1850s, now appear unknown.

Derek Pomeroy spoke on Scavengers in Kampala. Seeing Rooks Corvus frugilegus nesting as close as they can to the middle of main roads set me thinking about plasticity in birds behaviour and the case of scavengers in Kampala. We know now that Marabous *Leptoptilos crumeniferus* first nested in Kampala in 1969, with just a few pairs; now there are 600–700 nests p.a. There were about 200 Hooded Vultures *Necrosyrtes monachus* in Kampala in the early 1970s, now there are over 400. Outside Kampala, the majority of Marabou colonies are in urban areas. In Nairobi, however, it was not until the 1990s that Marabous started nesting in the city. As in Kampala they now nest along some of the busiest roads; further, in Kampala, some nests are in trees as low as 5 m. A request for further information on urban nesting by large scavengers in other African countries produced some suggestions. The increase was generally thought associated with the rising tide of rubbish as the human population increases. But we need to be wary of the future, in view of the now threatened adjutant storks, the Marabou's closest relatives.

Katrina Cook gave a presentation entitled *A murrelet of mystery*. The holotype of Kittlitz's Murrelet *Brachyramphus brevirostris* (Vigors, 1829) came to light recently in the collection of The Natural History Museum, Tring. The label data provide hitherto unknown information about the correct type locality of this specimen, collected by Beechey during the *Blossom* voyage, and previously erroneously recorded as San Blas. It also sheds light on the specimen's use as reference by J. J. Audubon who, probably along with Bonaparte, mistook this bird for a juvenile Ancient Murrelet *Synthliboramphus antiquus* and published it as such in the *Birds of America*.

Jo Cooper told the audience about *Rothschild's 1905 Red List*. At the 1905 International Ornithological Congress, Lord Rothschild delivered a lecture entitled 'On extinct and vanishing birds'. Supported by displays of numerous specimens and spectacular life-size reconstruction paintings, this presentation provided the initial seed for his later landmark book, *Extinct birds*. For the paper, Rothschild compiled lists of both extinct species and those he considered to be particularly threatened. He classed 53 taxa as being 'On the Verge of Extinction' and 46 taxa as being 'Threatened with Extinction'. Species from the Hawaiian, New Zealand and Mascarene archipelagos were noticeably well represented, reflecting Rothschild's interests and the activities of his collectors. Comparison of Rothschild's lists with the online World Bird Database of BirdLife International (http://www.birdlife.net/datazone/index.html) reveals how these species have fared during the past century. Of Rothschild's threatened taxa, 23% are now considered Extinct; 12% are Critically Endangered; 19% are Endangered; 28% are Vulnerable and 17% are Near-threatened or Least Concern. In conjunction with Rothschild's commentary, the lists provide a snapshot of his concerns and attitudes. He was well aware of many species' spiralling decline and was explicit in acknowledging man's role in their demise, emphasising over-exploitation and introductions of alien predators. At this time, he was renting Aldabra to protect its population of giant tortoises. Yet, in his discussion of endangered birds he offered no hopes for their future, and no suggestion that any of these pending extinctions could be averted.

Kassim N. Iddi spoke on *Taxonomic significance of vocalisations of sunbirds (Nectariniidae)*. Traditional avian taxonomy has primarily been concerned with morphological characters, but these have been inadequate for resolving relationships within, and differences between, genera and between sibling and cryptic species. Descriptions of new species now often include data on morphology, DNA and vocalisations or on at least two of these characteristics. Some comparative studies involving DNA analysis seemingly suggest strong congruence between acoustic and genetic divergence among species, e.g. in taxa of *Regulus*, whereas case studies of various Old World warblers such as the Golden-spectacled Warbler *Seicercus burkii* report high corroboration between bioacoustic divergence and molecular data. Irwin *et al.* concluded that the sunbirds originated in Africa and thence radiated to Asia. However, recent DNA studies have suggested that the lineage originated in Asia. I tested this hypothesis using vocalisations recorded from Asian species and comparing these with African recordings. Some taxonomists have included the flowerpeckers within the Nectariniidae whilst others place them in the Dicaeidae, so their affinities are also being analysed in terms of vocalisations. So far, sonograms of 148 species of sunbirds and 34 of flowerpeckers including many different subspecies have been created. Some songs appear very simple but others are very complex. Different parameters have been chosen to form a classification system and, where possible, recordings have been further separated on the basis of information provided by the recordists and from the vocalisations' characteristics according to their behavioural context. Results from both sonographic and the song tree analysis of 32 species of flowerpeckers strongly affirm flowerpeckers as close sister taxa and *Prionochilus* as a primitive outgroup, which is consistent with a view based on morphotaxonomy that the *Prionochilus* flowerpeckers are the most primitive members of the group.

Frank Ward, Hon. Secretary of *The Royal Naval Bird Watching Society* (RNBWS), gave a presentation outlining the Society and its scientific aims. The RNBWS was established in 1946 to encourage members serving in the RN, RM and WRNS in the study of birds at sea. There are *c*.250 members and reports received by the Society cover most sea areas of the world. About seven-tenths of the globe is covered with saltwater, providing an environment for nearly 300 species of seabirds. Many more landbirds travel across this habitat during their annual migrations and, especially in adverse weather, take refuge on board ships. Problems of identification, deduction of seasonal distribution and migration routes, etc. are challenges that provide a fascinating hobby for the seafarer. Such observations can be of unique importance to the ornithologist and conservationist. The scientific aims of the Society are to record the occurrence of both seabirds and landbirds on the world's oceans. Dr Russell Wynn acts as scientific adviser in evaluating the data, which are made available to the scientific community. The Society also continues to assist the OTEP and RSPB in seabird surveys around the world. Frank ended his presentation by showing some examples of the Society's website and database.

Ben Fisher entertained the meeting with a *Weaver nest conundrum*. He showed a nest supposed to be of *Ploceus ocularis* given to him in the Okavango Delta (Botswana) and collected by local boatmen. The short list of weavers in Botswana suggested that it could be nothing else but further reflection and more experience of *ocularis* nests (three more shown for comparison), suggest that it is not an *ocularis* nest. The specimen in question is much smaller and finer, and particularly has an entrance tube of only 4 cm against a typical measurement of 6 cm. Several knowledgeable observers present agreed that the nest was 'wrong'. The fact that the nest was in a reedbed attached to a reed was also unusual, if not unique, and further investigation is merited. Watch this space!

Guy Kirwan concluded with a talk on *Cuba: challenges for the modern taxonomist*, wherein he discussed some illustrated examples of problems facing those working with Cuban birds. Despite a relatively long history of ornithological exploration the archipelago's relatively small avifauna (just over 350 modern-day species) still tests the modern taxonomist. What are the correct generic allocations for endemic species such as Blue-headed Quail-dove *Starnoenas cyanocephala* and Bare-legged Owl *Gymnoglaux lawrencei* that are usually accorded their own genera? Is there more than one species of Greater Antillean Oriole *Icterus dominicensis* or Cuban Bullfinch *Melopyrrha nigra*? Other endemic forms are known from several races, but has there been a tendency to create more names than are genuinely required for describing the geographical variation that we currently see in species such as Gundlach's Hawk *Accipiter gundlachi* and Crescent-eyed Pewee *Contopus caribaeus*? Finally, a rather rich fossil avifauna is known from the islands. Among these forms is the poorwill *Siphonorhis daiquiri* which plausibly persists in the poorly explored xerophytic habitats of extreme eastern Cuba.

The 932nd meeting of the Club was held on Tuesday 27 September 2005, in the Sherfield Building Annexe, Imperial College, London. 20 members and 4 guests were present.

Members attending were: Cdr. M. B. CASEMENT (*Chairman*), Miss H. BAKER (*Vice-Chairman*), Dr K. B. BRIGGS, D. R. CALDER, Prof. R. A. CHEKE, J. B. FISHER, F. M. GAUNTLETT, D. GRIFFIN, C. A. R. HELM, R. H. KETTLE, R. R. LANGLEY, Dr C. F. MANN, D. J. MONTIER, Dr R. P. PRŶS-JONES, R. J. PRYTHERCH, N. J. REDMAN, Dr C. RYALL (*Speaker*), P. J. SELLAR, S. A. H. STATHAM and P. J. WILKINSON.

Guests attending were: Mrs J. CALDER, Mrs C. CASEMENT, Mrs M. H. GAUNTLETT and Mrs M. MONTIER.

After dinner, **Colin Ryall** spoke on *The worldwide spread of the House Crow*. The five subspecies of *Corvus splendens* have a native range extending from southern Iran, throughout the Indian Subcontinent to Myanmar and south-west China. They have spread beyond their native range, colonising *c*.20 countries bordering the Red Sea, Indian Ocean and its islands, and beyond. In addition, lone birds have reached 15 other locations in Europe, Asia, Australia and the Americas. Deliberate releases in Aden, Zanzibar and Klang initiated their spread from the mid 1800s, but subsequently it has primarily been ship-assisted, with overland spread so far being less significant. A population established in the Netherlands since 1994 is the first outside the tropics. They are typical crows in most respects, but are unusual in their close association with humans, high urban population densities and tendency for operating in large groups. Refuse is their main food source, supplemented by carrion, stolen food and crops, predation of small animals, etc. Foraging in large groups leads to them being widely regarded as a pest, as they displace native avifauna and other animals, attack livestock, raid crops, cause a public nuisance and health risk. Most control programmes have proved unsuccessful due to an eventual lack of resources. House Crows may be beneficial in consuming agricultural insect pests, remove ticks from livestock and consuming garbage. Given a lack of adequate evasive action, *Corvus splendens* is destined to become a pan-global species resulting in loss of biodiversity and adverse socio-economic impacts on poor communities. The species is poised to spread from Hong Kong into China, from Malaysia through South-East Asia, from South Africa to West Africa and Madagascar, and from the Netherlands across Europe. The author requested the audience look out for House Crows particularly in ports, coastal villages and towns, seafronts, peninsulas, refuse dumps, and to notify him via www.housecrow.com or colin.ryall@ntlworld.com.

Siegfried Eck 1942–2005

Dr Siegfried Eck was a well-known expert on Palearctic birds, maintaining an ongoing research interest in speciation and transcontinental species groups. Born in Germany, on 25 May 1942, Eck worked at Dresden's Zoological Museum from 1967 until his death, acting as head of the bird collection from 1995. Eck was able to acquire large numbers of bird specimens, mainly from smaller collections, making the Dresden collection one of the most important and type-richest of its kind in Europe. Eck died on 11 September 2005 in Dresden, two years short of his retirement.

Eck was better acquainted than anyone with the intra- and interspecific variations in Palearctic birds, enabling him to tackle the taxonomy of complex species groups such as the Paridae. In later years he widened his scientific approach from morphology to bioacoustics and genetics, when, in cooperation with the research team of Jochen Martens, he discovered the multi-specific nature of the *Seicercus burkii* complex. However, his *magnum opus*, a complete taxonomy of the Paridae, on which he worked for more than 30 years, remains uncompleted.

His work was honoured in 1988 when Eck was made a Corresponding Fellow of the American Ornithologists' Union. In 2002 the Johannes-Gutenberg-University of Mainz, Germany, awarded Eck an honorary degree in zoology for his 'outstanding scientific work on morphology and taxonomy of birds and his exemplary care and increase of zoological collections.' Eck's colleagues always appreciated his thorough, detailed and helpful reviews. He was just as much a sought-after guest at meetings of local bird societies. We lose one of the last classic museum ornithologists, a co-worker and friend, whose deep knowledge of avian morphology, taxonomy and nomenclature will be missed.

Christiane Quaisser & Frank D. Steinheimer

Joachim Steinbacher 1911–2005

Dr Joachim Steinbacher, who died on 31 July 2005 at the age of 93, was the former curator of ornithology at the Senckenberg Museum and Research Institute in Frankfurt. Born in Höxter, Germany, his uncle Friedrich Steinbacher was once president of the German Ornithological Society, whilst his cousin Georg Steinbacher authored a monograph on the foot morphology of zygodactyl birds. Encouraged by such illustrious relatives, Steinbacher's first foray into ornithology involved field surveys for the ornithological station of Heligoland. In the early 1930s he attended university in Göttingen and Berlin, and studied phylogenetic relationships of jacamars and puffbirds for his Ph.D., supervised by Erwin Stresemann. In Berlin, Steinbacher met some of the leading ornithologists of the day, Oskar Heinroth, Konrad Lorenz and Ernst Hartert. Steinbacher wrote later that the years with Stresemann, 1933–37, were influential not only in fostering his career, but also in the formation of his character and outlook on life.

In the 1940s he was employed by the public health office in Berlin and the Alexander Koenig Museum in Bonn, and volunteered for the Zoological Institute of the University of Marburg. His most productive period commenced in 1947 when he joined the Senckenberg Museum in Frankfurt. From holding a temporary position there, he become head of the ornithological section in 1954 until his retirement in 1976. He was responsible for the reorganisation of the entire ornithological collection and it is due to his efforts that most of the nearly 90,000 avian skins are almost completely card-indexed. He compiled several type lists and was the first person to work comprehensively on the collections of Baron Friedrich Heinrich von Kittlitz (1799–1874) and Eduard Rüppell (1794–1884). His scientific interests were broad and he published many hundreds of papers as well as being editor and author of several books, responsible perhaps most famously for the bird chapters in Grzimek's animal encyclopedia and the Threskiornithidae in Peters' Check-list (second edition). His last book, published in 2001, was on estrildid finches. From 1938 to 2005, he was the editor-in-chief (supported by his wife Elfriede, who died in 1990), of the *Gefiederte Welt*, a leading German avicultural magazine. Steinbacher continued travelling well into his eighties and maintained an active interest in avian science and 'his' museum, to which he presented his extensive library in 1991.

Frank D. Steinheimer & Gerald Mayr

CORRIGENDA

In Steinheimer (2005: *Bull. Brit. Orn. Cl.* 125 [3]), on p.165 (footnote 1) the correct name of the predecessor of the Natural History Museum should be given as British Museum (Natural History). On p.209 the name *Emberiza flaviventris flavigaster* Cretzschmar, 1828, as given in Dickinson (2003: 779), is correct. The final component of the specific epithet, *gaster*, is originally a Greek noun, and as such invariable (ICZN 1999, art. 31.2.1, 31.2.3 and 34.2.1; Robert Dowsett and Normand David *in litt.* October 2005). Dickinson (2003: *The Howard & Moore complete checklist of the birds of the world*: pp. 91, 139) introduced two further names of Rüppell to recent taxonomy, not cited in Peters' Check-list or my appendix, i.e. *Phalacrocorax carbo lugubris* Rüppell 1845, and *Gallinago nigripennis aequatorialis* Rüppell, 1845.

Frank D. Steinheimer

REFEREES

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Specimens of extinct and endangered birds in the collections of The Manchester Museum, The University of Manchester, UK

by Henry A. McGhie

Received 7 September 2004

Listings of museum holdings are of particular importance in ensuring that collections are accessible to researchers (Adams *et al.* 2003). Here, the holdings of extinct and endangered birds in The Manchester Museum, UK, are detailed. Criteria for inclusion were species listed by Adams *et al.* (2003), their list being derived from information contained in BirdLife International (2000). This list contains all species considered to have become extinct since 1500 or which are endangered or vulnerable due to very small populations, or declining and with a very small range (see Adams *et al.* 2003 for definitions). Species categorised as Vulnerable because of a small range, but which are currently relatively numerous are excluded. Several British museums have already published their holdings of extinct and endangered birds (Howes 1969, Benson 1972, Fisher 1981, Knox & Walters 1994), but criteria for inclusion have varied, thus these lists are not readily comparable. The Manchester Museum is committed to ensuring that its collections are used for the maximum possible benefit, both now and in the long term, and as such welcomes enquiries of all kinds, from professionals and amateurs.

Collections

The museum's collections were formed around those of the Manchester Natural History Society (1821–68), which were transferred to Owens College (now The University of Manchester) and housed in the present, purpose-built museum since 1888. The nucleus was added to piecemeal, most notably by the addition of the bird skin collection of Henry Eeles Dresser (1838–1915), of *c.*12,000 skins. This collection consists almost entirely of Palearctic birds and formed the basis for Dresser's monumental *History of the birds of Europe* (1871–81, supplement 1895), begun with R. B. Sharpe. Dresser's skin collection was purchased by J. P. Thomasson, in 1899, for the peppercorn sum of £1,000 and donated to Owens College; Dresser's egg collection (*c.*4,000 lots) was purchased by the family of J. P. Thomasson and donated to the museum for a similar sum, although it had been housed at the museum since 1912. The museum also received a large donation of birds from the British Museum (Natural History), in 1895, and a small but highly significant collection of Hawaiian birds from the Royal Society and Joint Committee for the Zoology of the Sandwich Islands, via Cambridge University Museum of Zoology, in 1900. The total bird collections comprise 15,000 skins plus *c.*2,000 mounts, 500 lots of skeletal material and 12,000 sets of eggs, of over 3,000 species.

Species entries

Taxonomy follows Adams *et al.* (2003), which in turn is based on that in BirdLife International (2000). For each species, the number of specimens, together with information on locality, provenance and the museum accession number is presented. Previous collectors' field numbers are included in brackets after the collector's name. Skins are of adults unless otherwise stated.

The following abbreviations are used:

BM(NH)	British Museum (Natural History)
coll.	collected by
D	Henry Eeles Dresser (1838–1915)
ex	unsexed specimen
leg.	received from
purch.	purchased from
MNHS	Manchester Natural History Society (1821–68)
ni	no information
RCZSI	Royal Society and Joint Committee for the Zoology of the Sandwich Islands
[ ]	collection of

EXTINCT SPECIES

Haematopodidae

Canary Islands Oystercatcher *Haematopus meadewaldoi*

Skins: ♂, Jandia, Fuerteventura, Canary Islands, 20/4/1888, [D, leg. R Gomez] B.9162; ♀, Jandia, Fuerteventura, Canary Islands, 6/5/1889, [D, leg. R Gomez] B.9163.

NB these specimens are not listed in Vaurie (1965).

Alcidae

Great Auk *Pinguinus impennis*

Partial skeletons: 2 humeri, 2 tarsi, furcula, synsacrum, skull, leg. F Nicholson 1907, B.4757.

Raphidae

Dodo *Raphus cucullatus*

Partial skeletons: 14 bone fragments, leg. Boyd Dawkins (ex Richmond Mus.) 1904, B.4656; tarsometatarsus, leg. Boyd Dawkins (ex Richmond Mus.) 1919, BB.3534.

Casts: 2 (casts of head, foot), taken from specimens in Oxford Univ. Mus. Nat. Hist., leg. Boyd Dawkins 1919, BB.3532 BB.3530 respectively; 1 (tarsometatarsus and 4 digits), leg. Boyd Dawkins (ex Richmond Mus.) 1919, BB.3531; casts of tibia and tarsometatarsus, leg. Boyd Dawkins 1919, BB.3533 BB.3534.

Columbidae
Passenger Pigeon *Ectopistes migratorius*
Skins: ♂♀, Toronto, Canada, coll. J Morley /4/1875, [L E Mather] BB.6973 BB.6974; 1 ex (mounted), BB.3523.
Eggs: 2, ni, [Barber] BB.8063.12; 1 (cracked), ni, BB.5470.

Psittacidae
Carolina Parakeet *Conuropsis carolinensis*
Skins: 1 ex, Enterprise, Florida, coll. J Morley /2/1875, [L E Mather] BB.7113.

Paradise Parrot *Psephotus pulcherrimus*
Skins: 2 ♂♂ (study skin and ex mount), Gatton, leg. A W W B Brown 1889, B.455 B.456; 2 ♂♂ (mounted), ni, [MNHS?] BB.4706.

Pachycephalinae
South Island Piopio *Turnagra capensis*
Skins: 2 ex (mount and ex mount), South Island, New Zealand, leg. E Melland, BB.1278 BB.1279.

Drepanidinae
'Akialoa *Akialoa obscura*
Skins: ♂, Kau, Hawaii, Hawaiian Islands, coll. R C L Perkins /6/1895 (no. 522), [RSZSI] B.7394.

Kauai 'Akialoa *Akialoa stejnegeri*
Skins: ?, Kaholuamano, Kauai, Hawaiian Islands, coll. R C L Perkins /10/1895 (no. 666), [RSZSI] B.3314.

Kakawahie *Paroreomyza flammea*
Skins: ♂, Molokai, Hawaiian Islands, coll. R C L Perkins /5/1893 (no. 185), [RSZSI] B.3303.

Kona Grosbeak *Psittirostra kona*
Skins: ♀, Kona, 4,000 feet, Hawaii, coll. R C L Perkins 2/8/1892 (no. 580), [RSZSI] B.7400.

Greater 'Amakihi *Viridonia sagittirostris*
Skins: ♀, Hilo, 2,000 feet, Hawaii, coll. R C L Perkins /1/1896 (no. 536), [RSZSI] B.3320.

Callaeidae
Huia *Heteralocha acutirostris*
Skins: ♂♀ (mounted), New Zealand, purch. J H Fleming 1898, B.2227 B.2228.

ENDANGERED SPECIES

Phalacrocoracidae
New Zealand King Shag *Phalacrocorax carunculatus*
Eggs: 1 (cracked), Cirhh, New Zealand, [D, purch. Stoate sale] BB.5660.4004.

Threskiornithidae
Northern Bald Ibis *Geronticus eremita*
Skins: 2 ♂♂, Birecik, Euphrates Valley, coll. C G Danford 20/2/1879, [D] B.9894 B.9895.
Eggs: 1, 'Algier', coll. Major Locke, [D] BB.5660.1888.

Black-faced Spoonbill *Platalea minor*
Partial skeletons: 1 ex (skull), BB.5294.

Anatidae
Hawaiian Goose *Branta sandvicensis*
Skins: 1 ex (mounted), ni, BB.4501; ♀, Slimbridge, 21/5/1960, BB.8161.

Accipitridae
Spanish Imperial Eagle *Aquila adalberti*
Skins: ♂, near Madrid, Spain, coll. M de la Torre 1866–67, [D] B.10383; ♀, Seville, Spain, coll. Sanchez 24/10/1870, [D] B.10385; ♂, Seville, Spain, coll. Sanchez 13/11/1870, [D] B.10384; 1 ex, Hivondrana, near Burgos, Spain, coll. Starkey /6/1889, [D] B.10387; 1 ex, Seville, Spain, coll. A Ruiz, [D] B.10388.

Eggs: 2, Pinal de Anarcazar, coll. Lord Lilford 24/3/1873, [D] BB.5660.1596; 1, near Seville, Spain, coll. Lord Lilford 22/3/1874, [D] BB.5660.1594; 1, near Seville, Spain, coll. Lord Lilford 24/3/1874, [D] BB.5660.1593; 1, Coto Doñana, coll. Lord Lilford /4/1874, [D] BB.5660.1595.

Scolopacidae
Eskimo Curlew *Numenius borealis*
Skins: 1 ex, Texas, coll. A L Heermann 1861, [D] B.9395; ♂, Toronto, Canada, coll. J S Morley /6/1877, [L E Mather] BB.6972.

Slender-billed Curlew *Numenius tenuirostris*
Skins: 2 ♂♂, Malta market, coll. C A Wright 9/4/1864, [D] B.9379 B.9380 respectively; 1 ex, Morocco, coll. Capt. S G Reid 23/12/1881, [D] B.9382; 1 ex (beak damaged), 'southern Europe', [D, leg. Verreaux] B.9381.

Eggs: 1, Tara, Siberia, coll. V E Ushakov /5/1909, [D, leg. S A Buturlin] BB.5660.2539 (NB this may well be the only extant egg of the species).

Recurvirostridae
Black Stilt *Himantopus novaezelandiae*
Eggs: 2, New Zealand, coll. 22/12/1884, [Holdsworth] BB.7283.209.

Psittacidae
Kakapo *Strigops habroptilus*
Skins: 1 ex (mounted), Lake Te Anau, South Island, New Zealand, leg. E Melland, BB.1261; 1 (ex mount), ni, BB.4716; 1 ex, leg. A W W Brown, B.2555; 1 ex, ni, B.935; 1 ex, ni, BB.4717.

Complete skeletons: 1 ex (mounted), sounds on west coast of New Zealand, coll. 7/10/1882, leg. A W W Brown B.2237.

Eggs: 1, New Zealand, leg. E Melland 25/1/1898, BB.1326.

Trochilidae
Black-breasted Puffleg *Eriocnemis nigrivestis*
Skins: 2 ♂♂, north Ecuador, [BM(NH), leg. J Gould, one specimen BM(NH) accession no. 57.4.20.3] B.1606.

Picidae
Ivory-billed Woodpecker *Campephilus principalis*
Skins: ♂♀ (ex mounts), 'Weekiva', Florida, coll. J S Morley /8/1876, [L E Mather] BB.8793.1 BB.8793.2 respectively.

Cotingidae
Kinglet Calyptura *Calyptura cristata*
Skins: 2 ♂♂ (ex mounts), south-east Brazil, pre-1873, [MNHS] B.6327 B.6328.

Turdinae
Oloma'o *Myadestes lanaiensis*
Skins: ♂, Molokai, Hawaiian Islands, coll. R C L Perkins 9/9/1893, [RSZSI] B.3315.

Drepanidinae
Maui Parrotbill *Pseudonestor xanthophrys*
Skins: ♀, 5,000 feet, Haleakala, Maui, Hawaiian Islands, coll. R C L Perkins (no. 819), [RSZSI] B.7399.

Maui Nukupu'u *Hemignathus lucidus affinis*
Skins: ♂, Haleakala, 5,000 feet, Maui, Hawaiian Islands, coll. R C L Perkins /5/1896 (no. 838), [RSZSI] B.3306.

Kauai Nukupu'u *Hemignathus lucidus hanapepe*
Skins: ♂, Kaholuamano, Kauai, Hawaiian Islands, coll. R C L Perkins /10/1895 (no. 689), [RSZSI] B.3306.

'Akikiki *Oreomystis bairdi*
Skins: ♂, Kaholuamano, Kauai, Hawaiian Islands, coll. R C L Perkins /10/1895 (no. 765), [RSZSI] B.3311.

Fringillidae
Azores Bullfinch *Pyrrhula murina*
Skins: ♂♀, São Miguel, Azores, coll. F D Godman /4/1865, [D] BB.2859 BB.2860 (syntypes of *P. murina*); 1 ex, Azores, leg. BM(NH), B.3052 (possible syntype of *P. murina*).

Callaeidae
Kokako *Callaeas cinerea*
subspecies *wilsoni* (North Island Kokako)
Skins: 1 ex (ex mount), [North Island] New Zealand, pre-1873, [MNHS] B.8211.
subspecies *cinerea* (South Island Kokako)
Skins: 1 ex, Lake Teanau, South Island, New Zealand, leg. E Melland, BB.1262.

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A mystery solved: the identity and distribution of Kalinowski's Tinamou *Nothoprocta kalinowskii*

by Niels Krabbe & Thomas S. Schulenberg

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Kalinowski's Tinamou *Nothoprocta kalinowskii* Berlepsch & Stolzmann 1901 is believed to have an unparalleled geographical range and to be on the brink of extinction (Collar *et al.* 1992, BirdLife International 2000). The type specimen was collected in mountains near Licamachay, a location thought to be near Cuzco, in interior south-central Peru (Stephens & Traylor 1983). Much later, two additional specimens, both from dpto. La Libertad, in the western Andes of northern Peru also

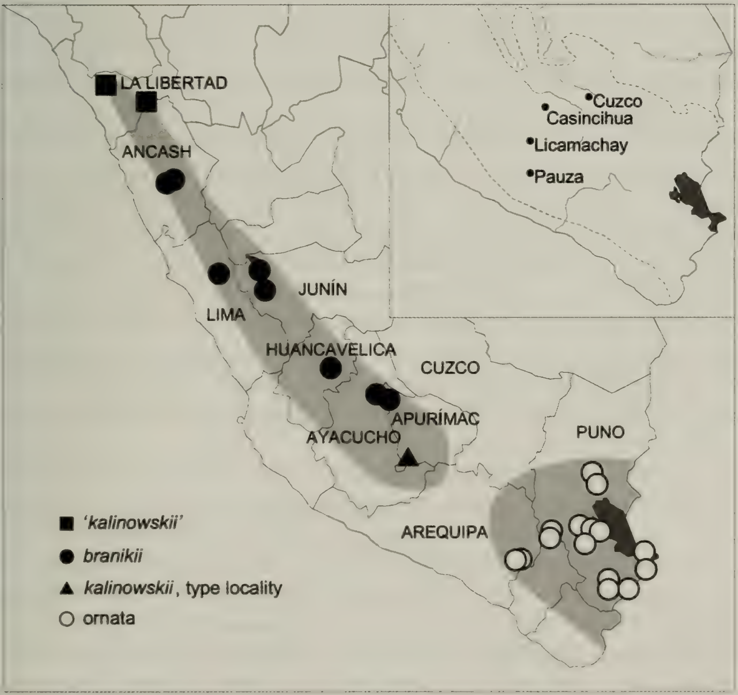

LA LIBERTAD
ANCASH
JUNÍN
LIMA
HUANCAVELICA
CUZCO
APURÍMAC
AYACUCHO
PUNO
AREQUIPA
Cuzco
Casincihua
Licamachay
Pauza
■ 'kalinowskii'
● branikii
▲ kalinowskii, type locality
○ ornata

Figure 1. Distribution in Peru of *Nothoprocta ornata*, based on specimen records. Shown are the locations of the two specimens of *Nothoprocta kalinowskii* at the northern end of the distribution of *Nothoprocta ornata branickii* and of Licamachay, the type locality of *kalinowskii* near the southern end of the distribution of *branickii*. The exact location of Licamachay is not known, but was estimated from Kalinowski's route in the spring of 1894 (inset map; see text).

were identified as *kalinowskii* (Meyer de Schauensee 1966, Vasconcelos 2002). Thus, the reported distribution of *kalinowskii* is highly disjunct and quite unlike that of any other Peruvian bird. And, if all three specimens of *kalinowskii* represent the same taxon, it is difficult to imagine how *kalinowskii* could be a subspecies of the widespread Ornate Tinamou *Nothoprocta ornata*, as suggested in some literature (Hellmayr & Conover 1942, Blake 1977, Fjeldså & Krabbe 1990), and yet occur in two highly disjunct populations at opposite ends of the distribution of another subspecies of *ornata*. Furthermore, the apparent extreme rarity of *N. kalinowskii* led to its classification as 'Endangered/Extinct' by BirdLife International (Collar *et al.* 1992).

This confusing situation arose, at least in part, because few ornithologists ever studied the type specimen; apparently, few ornithologists paid due attention to details of the type description either. Recently one of us (NK) re-examined the type of *kalinowskii*. This led to a re-evaluation of the status of this taxon. In brief, the type of *kalinowskii* from Licamachay is a junior synonym of *Nothoprocta ornata branickii*. The two specimens of '*kalinowskii*' from La Libertad, although redder than other specimens, may represent nothing more than individual or perhaps clinal variation. Our investigations reveal that the two isolated populations of *Nothoprocta kalinowskii* are not the same, and that neither population represents a distinct species.

N. kalinowskii was described by Berlepsch & Stolzmann (1901), on the basis of a single specimen collected on 1 May 1894 at Licamachay by Jean Kalinowski. Berlepsch and Stolzmann described the location only as 'Peruvia centrali: circum Licamachay, Kordiljery'. Just five years after describing *kalinowskii*, Berlepsch & Stolzmann (1906) discussed the travels of Kalinowski thus: 'In April 1894 he travelled towards Cuzco, capital of the department, also visiting Licamachay and Curahuasi (Apurímac Valley)'. This statement may have influenced Vaurie (1972) and Stephens & Traylor (1983) to place Licamachay in dpto. Cuzco. No one has been able to locate a place by that name in Cuzco, and searches for a bird resembling the type of *kalinowskii* in the vicinity of Cuzco also have failed (B. Walker *in litt.* 1999).

Based on a digitised database of specimens in the Warsaw Museum forwarded in 1999 to TSS by Dr Mazgajski of the Polish Academy of Science, it was possible for TSS to reconstruct the Peruvian itinerary of Kalinowski (Table 1). It is evident that Licamachay was en route between Pauza, southern dpto. Ayacucho and the town of Cuzco, dpto. Cuzco. The final day Kalinowski collected a specimen at Pauza was on 11 April 1894. He was in Cuzco a month later, on 13 May. We are aware of only three specimens collected by Kalinowski during the intervening period. These three specimens collected en route were taken at Licamachay on 1 May (the type of *N. kalinowskii*), at Casinchihua on 7 May (*Pachyramphus validus*) and at Curahuasi on 10 May (*Poospiza caesar*). Casinchihua and Curahuasi are known localities in the Apurímac Valley. Evidently, Kalinowski collected at Licamachay before descending into the Apurímac Valley on his way to Cuzco. He could not have travelled all the way from dpto. Ayacucho to Casinchihua in just six days, so Licamachay must have been situated somewhere in dpto. Apurímac. This places the type locality of *kalinowskii* very close to or within the range ascribed to the central Peruvian race of Ornate Tinamou *N. ornata branickii* (see Fig. 1).

In September 2003, during a visit to the Museum and Institute of Zoology, Polish Academy of Science (MIZPAS), in Warsaw, NK examined and photographed the types of *N. kalinowskii* and *N. ornata branickii*. He noticed that the diagnostic features separating them had been exaggerated in the type description of *kalinowskii*. The principal stated differences from *branickii* are that *kalinowskii* is paler and greyer, and has longer wings. A comparison of the type with 12 specimens of *branickii* from dptos. Apurímac, Ayacucho, Junín and Ancash reveals that these differences represent no more than individual variation. Several other specimens are equally as pale and grey as the type of *kalinowskii*. The length of the flattened wing is 183 mm in the type of *kalinowskii*, 170 mm in the type of *branickii* (both are males). In three other adult male *branickii* the length is 163–179 mm (in six adult females 166–192 mm). The most notable difference between the types of *kalinowskii* and *branickii* is the finer barring on the secondaries of *kalinowskii*, but the pattern and coloration of this tract vary considerably in specimens of *branickii* at hand. The fine barring of the tertials spreads onto a variable number of secondaries, and the pale bars on the remaining secondaries vary from buff, wavy and narrower than the dark bars, to rufous, straight and the same width as the dark bars, suggesting that the type of *kalinowskii* is merely an extreme individual variant in this respect.

Blake (1977) noticed that three specimens in the American Museum of Natural History, New York (AMNH), from dpto. Junín are somewhat redder on the belly than three in the Field Museum of Natural History, Chicago (FMNH), from dptos. Apurímac and Ayacucho. One specimen in the Natural History Museum, Tring (BMNH), from Huancavelica has a similar reddish belly. However, the type of *branickii* from dpto. Junín is nearly as extensively grey on the underparts as the Apurímac and Ayacucho specimens, including the type of *kalinowskii*. Six recently collected specimens in AMNH and the University of California, Museum of Vertebrate Zoology, Berkeley (UCMVZ), of *branickii* from dpto. Ancash also do not differ appreciably from the greyer specimens collected further south. Evidently *branickii* is variable in the colour of the underparts.

How the specimen from dpto. La Libertad in north-west Peru was ever referred to *kalinowskii*, and the resulting extraordinary distribution accepted without question, is a mystery. This specimen never was compared directly with the type. The first mention of it in the literature appears to be in Meyer de Schauensee (1966), who reported the specimen as *kalinowskii* '*fide* [Maria] Koepcke'. It is of unknown sex and was collected in the western Andes at Hacienda Tulpo, dpto. La Libertad, in 1900, and is retained in AMNH. Published illustrations of Kalinowski's Tinamou (Fjeldså & Krabbe 1990, del Hoyo *et al.* 1992) were based on this specimen. Subsequently, Vasconcelos (2002) published a description and

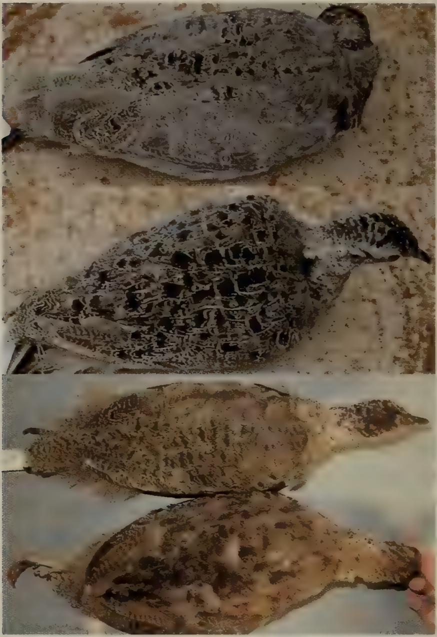
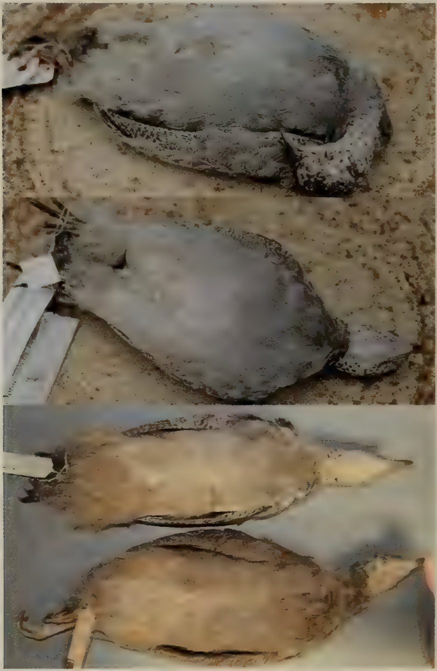
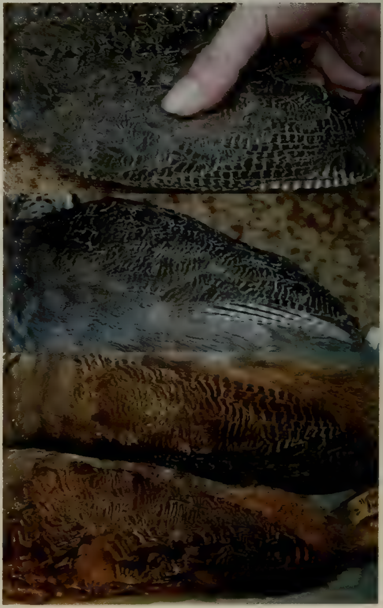
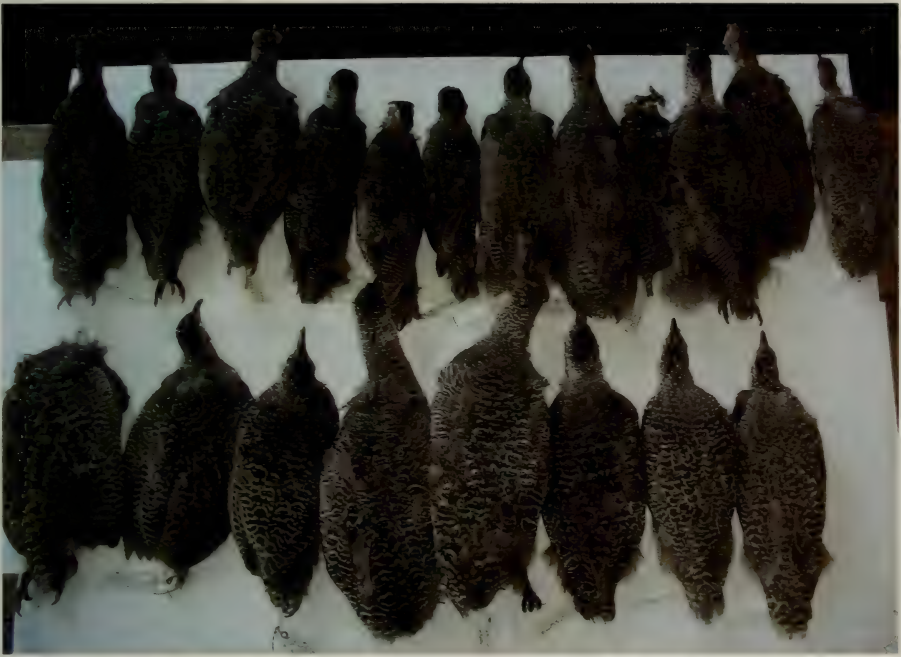


Figure 1 (this page). Dorsal, ventral and wing views of (anticlockwise from top): MIZPAS P 2306 type of *kalinowskii*, MIZPAS P 2309 type of *branickii*, AMNH 814068 *branickii* from Ancash, Peru, and AMNH 469176 *kalinowskii* from Tulpo, La Libertad (Niels Krabbe)

Figure 2 (opposite page). Dorsal and ventral views of the plumage of *Nothoprocta ornata*. Top left to right 12 *N. o. branickii*: FMNH 25119 female (Apurímac), FMNH 25295 male (Apurímac), FMNH 18894 female (Ayacucho), AMNH 165427 female (Junín), AMNH 165426 female (Junín), AMNH 165428 male (Junín), UCMVZ 161354 female (Ancash), AMNH 814069 female (Ancash), AMNH 814070 unsexed (Ancash), AMNH 814068 male (Ancash), UCMVZ 161356 immature male (Ancash), UCMVZ 157675 immature male (Ancash). Bottom left to right one *N. o. rostrata* and seven *N. o. ornata*: ZMUC 20.12.1910.6 female (Tucumán), ZMUC 91643 female (Cochabamba), ZMUC 91644 male (Cochabamba), UCMVZ 125590 female (Puno), UCMVZ 125591 male (Puno), UCMVZ 124272 male (Puno), UCMVZ 125592 immature male (Puno), UCMVZ 125140 male (Puno) (Niels Krabbe)







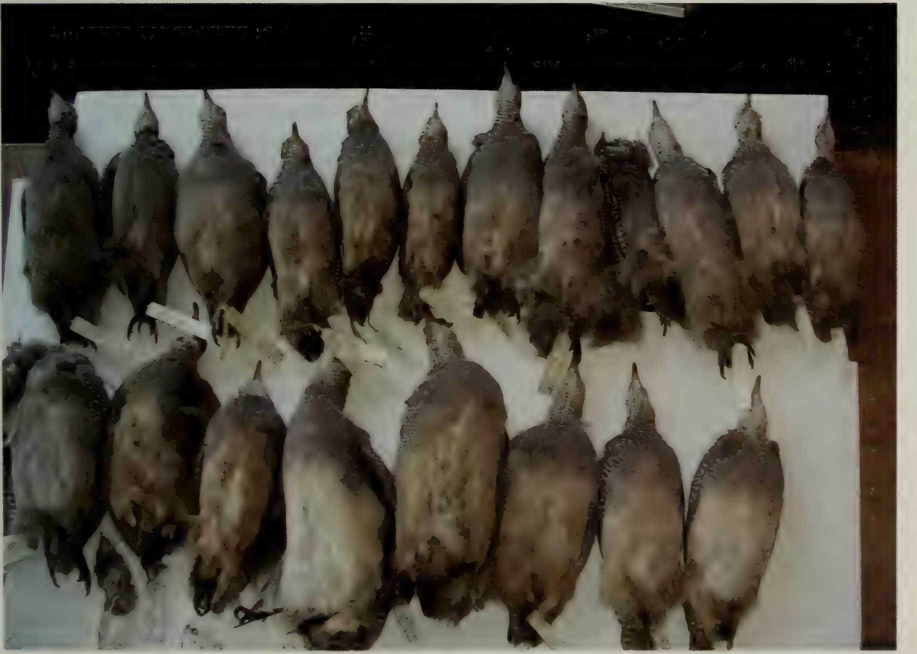


TABLE 1

Reconstruction of Kalinowski's travels in Peru and Bolivia. Based on published literature and a digitised database of the bird specimens in Warsaw Museum.

Date	Year	Department	Locality	Notes
24 Aug–25 Oct	1889	Lima	Lima	
26 Oct	1889	Lima	Chorillos	
29 Oct - 21 Nov	1889	Lima	Lima	
22 Nov–31 Dec	1889	Ica	Ica	Incl. Hacienda Ocucaje and Hacienda Huamani
14–24 Jan	1890	Lima	Lima	
29 Jan	1890	Lima	Ancón	
31 Jan–22 Mar	1890	Lima	Lima	Incl. Magdalena and Magdalena Vieja
21 Apr	1890	Lima	Baños	
27 Apr	1890	Lima	Chicla	
29 Apr	1890	Lima	Baños	
30 Apr	1890	Junín	San Blas	
2 May–29 Jun	1890	Junín	Junín	Incl. Lake Junín, Ingapirca, Jez. Junín
10 Jul	1890	Junín	Palcamayo	
11 Jul	1890	Junín	Acobamba	
13 Jul–16 Sep	1890	Junín	Chanchamayo	Incl. Hacienda La Merced and Hacienda La Gloria
21 Sep	1890	Junín	Acobamba	
24 Sep	1890	Junín	Tarma	
5–11 Oct	1890	Junín	Junín	Incl. Ingapirca and Jez. Junín
15 Dec	1890	Junín	Tarma	
30 Dec–11 June	1890–1891	Junín	Chanchamayo	Inc. Hacienda La Merced, Hacienda La Gloria and Hacienda La Borgona
16 Jun–3 Oct	1891	Junín	Vitoc	Incl. Hacienda La Garita del Sol and Hacienda La Gloria
25 Oct–22 Dec	1891	Junín	Maraynioc	Incl. Pariayacu
21 Mar	1892	Lima	Lima	
22 Jun–14 Dec	1892	Junín	Maraynioc	Incl. Pariayacu, Chulumachay, Tendalpata, Hacienda La Merced, Hacienda Garita del Sol (Vitoc) and Huacras
24 Dec	1892	Junín	Tapo	
25–27 Dec	1892	Junín	Tarma	Incl. Hacienda Queta
27 Dec	1892	Junín	Tapo	
1 Jan–21 Jun	1893	Junín	Maraynioc	Incl. Chulumachay, Tendalpata, Pariayacu, Sarnapaycha, Hacienda La Garita del Sol (Vitoc), Tambo de Aza, San Emilio
8 Jul–2 Sep	1893	Junín	Tarma	Incl. Janja and Hacienda Queta
12 Nov–27 Jan	1893–1894	Ayacucho	Cora Cora	
14 Feb–11 Apr	1894	Ayacucho	Pauza Mountains near Licamachay	
7 May	1894	Apurímac	Casinchihua	
10 May	1894	Apurímac	Curahuasi, Apurímac Valley	
13 May	1894	Cuzco	Cuzco	
21 May	1894	Cuzco	Cuzcohuata	

31 May–21 Dec	1894	Cuzco	Idma, Hacienda Santa Ana	Incl. Puna de Idma
24–27 Jun	1895	Cuzco	Vilcabamba	
6–28 Dec	1895	Puno	Puno	
5 Jan	1896	Cuzco	Checcacupi	
30 Jan and 8 Mar	1896	Cuzco	Cuzco	
22 Mar–28 Jun	1896	Puno	Puno	
2 Jul	1896	Puno	Pujuni	
2 Jul	1896	Puno	Pichacani	
4 Jul	1886	Puno	Titirí	
5 Jul	1896	Puno	laguna de Pakará	
5–6 Jul	1896	Puno	Huacochujo	
6–7 Jul	1896	Puno	Pichacani	
15–25 Jul	1896	Puno	Titirí	
25 Jul	1896	Puno	Pujuni	
17 Sep–7 Dec	1896	La Paz	Chulumani	Incl. Choquechaca and Tusiguaya
8 Dec	1896	La Paz	La Florida	
8 Dec	1896	La Paz	Puente de Chupe	
10 Dec	1896	La Paz	Huacuyu	
17 Jun	1897	Cuzco	Chilichili	
2 Jul	1897	Cuzco	Iscaybamba	
6 Jul–7 Dec	1897	Cuzco	Marcapata Valley	Incl. Huaynapata and Saniaca
10–17 Jan	1898	Cuzco	Cuzco	
4 Jul	1898	Cuzco	río Garrota	
11 Jul–28 Dec	1898	Cuzco	Marcapata	Incl. Huaynapata, río Cadena and Escopal
	1902–1930	Cuzco	Marcapata	Incl. Hacienda Cadena, Cadena, río Cadena, Paucartambo

photograph of a rather similar specimen taken nearby as *N. kalinowskii*. It is a male housed in the ornithology collection of the Universidade Federal de Minas Gerais (DZUFMG), in Belo Horizonte, Brazil, and was collected in 1970 at Sinsicap, Otuzco, dpto. La Libertad. These two have slightly darker rufous bars than those specimens of *N. ornata branickii* that exhibit broad rufous bars on their secondaries. They are also a trifle more saturated reddish on the rest of the body. The belly appears to vary in the same way as in specimens from further south. That of the AMNH specimen is fairly reddish, whereas that of the DZUFMG specimen (judged from the published photo) is more washed with grey. On the basis of just two specimens and in view of the variability of other populations we consider the difference to be no more than trivial variation, but admit that the collection of a larger series might demonstrate the La Libertad population to be worthy of recognition as a subspecies of *Nothoprocta ornata*.

Acknowledgements

We are indebted to Dr Mazgajski of the Polish Academy of Science, who kindly forwarded a digitised database of the Peruvian specimens in the Warsaw Museum (MIZPAS); to Malgorzata Adamczewska, who carefully checked specific birds in the MIZPAS collection and was of great assistance during NK's visit to the collection; to Bøje Benzon's Foundation, who generously funded NK's visit to the Warsaw museum; to the curators of various museums: Paul Sweet (AMNH), Katrina Cook (BMNH), Shannon Hackett (FMNH), Becky Williams and Carla Cicero (MVZ), and C. Rahbek, Zoological Museum, Univ. of Copenhagen (ZMUC), for the loan of specimens or taking and sending of specimen photos. We are grateful to Laura Rico for preparing the map.

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APPENDIX

Specimens examined:

N. ornata rostrata: 1 female, Tucumán, Argentina (ZMUC)

N. ornata ornata: 1 female, 1 male, Cochabamba, Bolivia (ZMUC); 4 males, 1 female, Puno, Peru (UCMVZ)

N. ornata branickii: 1 male, mountains near Licamachay [Apurímac] (type of *kalinowskii* in MIZPAS); 1 male, 1 female, Apurímac (FMNH); 1 female, Ayacucho (FMNH); 1 male, Huancavelica (BMNH, photos); 1 male, Junín (type of *branickii* in MIZPAS); 1 male, 2 females, Junín (AMNH), 1 male, 1 female, 1 unsexed, Ancash (AMNH); 2 males, 1 female, Ancash (UCMVZ); 1 unsexed, La Libertad (AMNH, photos of specimen referred to *kalinowskii* in the literature); 1 male, La Libertad (published photo of specimen referred to *kalinowskii* in DZUFMG).

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The taxonomic status of the Redshank *Tringa totanus* in Italy

by William G. Hale, Francesco Scarton & Roberto Valle

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In a revision of the taxonomy of the Redshank *Tringa totanus* based on examination of a large series of specimens, Hale (1971) suggested that current European populations were the result of hybridisation between two previously separated populations that had evolved in different glacial refuges. Cinnamon birds, from eastern Russia, probably interbred with a dark brown population breeding in Western Europe, giving rise to a hybrid zone in which different colour forms now exist and different degrees of breeding plumage are assumed (many individuals retain winter feathers).

Museum collections around the world possessed just 11 birds collected in Italy or thereabouts during the breeding season, three of which were unsexed, making the country among the least represented in terms of numbers in the taxonomic analysis. In recent years three more specimens have become available, giving a total of 11 sexed birds. At the time, this was thought to reflect the very small numbers of Redshank breeding in Italy, but subsequent work by Valle *et al.* (1995) revealed a population of 1,076–1,169 breeding pairs, of which 90% were in the Lagoon of Venice. A more recent census, performed in 2001, produced an estimated *c.*1,600 pairs (Scarton & Valle 2004). The Redshank population in the lagoon is one of the most important in the Mediterranean Basin (Valle & Scarton 1996), and has been studied from 1985 until the present (2004). Despite its importance, the morphological characteristics of this population have not been studied previously.

Between 1993 and 2001 (none was measured in 1996) 153 different Redshanks were trapped at the nest, ten individuals on two occasions in different years, and the resultant mensural data are now available for taxonomic assessment. Here, these are compared with similar field data from Redshanks trapped in the British Isles and Denmark. Three dominant colour forms exist in Western Europe: a cinnamon form typical of Iceland and the British Isles, wherein nearly all birds retain some winter plumage, whilst in continental Europe grey and brown morphs co-exist (Harrison 1944).

Study area

The Lagoon of Venice covers *c.*55,000 ha and is connected to the Adriatic Sea via three entrances; it is the largest lagoon in the Mediterranean and hosts significant populations of breeding waterfowl at national level (e.g. Redshank, Oystercatcher *Haematopus ostralegus*, Sandwich Tern *Sterna sandvicensis*, Common Tern *S. hirundo*, Shelduck *Tadorna tadorna* and Pygmy Cormorant *Phalacrocorax pygmeus*), and for the first three-named species at Mediterranean level (Valle &

Scarton 1999, Scarton & Valle 2000). The northern and, especially, the southern parts of the lagoon possess hundreds of muddy, intertidal islets vegetated with halophytes (mainly *Puccinellia palustris*, *Limonium narbonense*, *Sarcocornia fruticosa* and *Spartina maritima*), which cover *c*.4,000 ha. A few of these islets (10–15 p.a.) are used by colonies of one or, more frequently, several species of Laridae (Black-headed Gull *Larus ridibundus*, a mean 120 pairs in 1997–99; Common Tern 940 pairs; Little Tern *Sterna albifrons*, 195 pairs; and Sandwich Tern 470 pairs: Valle & Scarton 1999). Here, Redshanks also nest in colonies (2–200 pairs), but many isolated pairs are scattered over other saltmarsh islets. The breeding season extends from March to June, with peak laying in late May (Valle & Scarton 1995). The species occurs in the lagoon year-round; in winter, January counts gave a mean 353 birds in 1996–2000 (Baccetti *et al.* 2002), although the majority of these are probably not Italian breeders.

Methods

Redshanks were caught using walk-in traps placed over the nests, and these were constructed with nylon tops to prevent any damage to the birds (Thompson & Hale 1989). Birds were weighed, sexed, measured (both wings, tail, bill length, tarsus length and tarsus width) and counts of breeding-plumage feathers in a square of 25 mm^2 on the mantle and breast, together with counts of the total number of breeding-plumage feathers amongst the scapulars (both sides) and tertials (both sides). For consistency, all these procedures were undertaken by one of us (WGH) accompanied by an Italian ringer (responsible for the ringing), and all birds were photographed dorsally and ventrally for future comparative purposes. Further details of the methodology can be found in Hale (1971). Sexing was undertaken mainly by examining the cloaca, which is enlarged in females at this season. This is reliable where comparisons with paired histories of individuals are known (Hale in prep.), but used exclusively, as here, occasional mis-sexing may occur.

Trapping normally took place at least four days after clutch completion and incubation had begun, in late May–early June at three colonies in the southern lagoon; in particular, most birds were from one colony, located near an old ruin (45°18'N, 12°11'E; Fig. 1), which was used when handling the birds.

Comparisons were made with two other populations trapped and measured by WGH: in the UK, 2,755 birds were measured in 1973–88, and 34 birds were measured in Denmark in 1975. Parametric (t-test, ANOVA and Tukey HSD for unequal sample size) or non-parametric (Mann-Whitney and Kruskal-Wallis) tests were used, according to the model of data distribution; ANOVA was also used for a few variables that were not normally distributed, given its robustness with respect to the assumption of the underlying populations' normality (Zar 1996). The statistics package STATISTICA 5.0 was used; probability level was set to $p=0.05$.

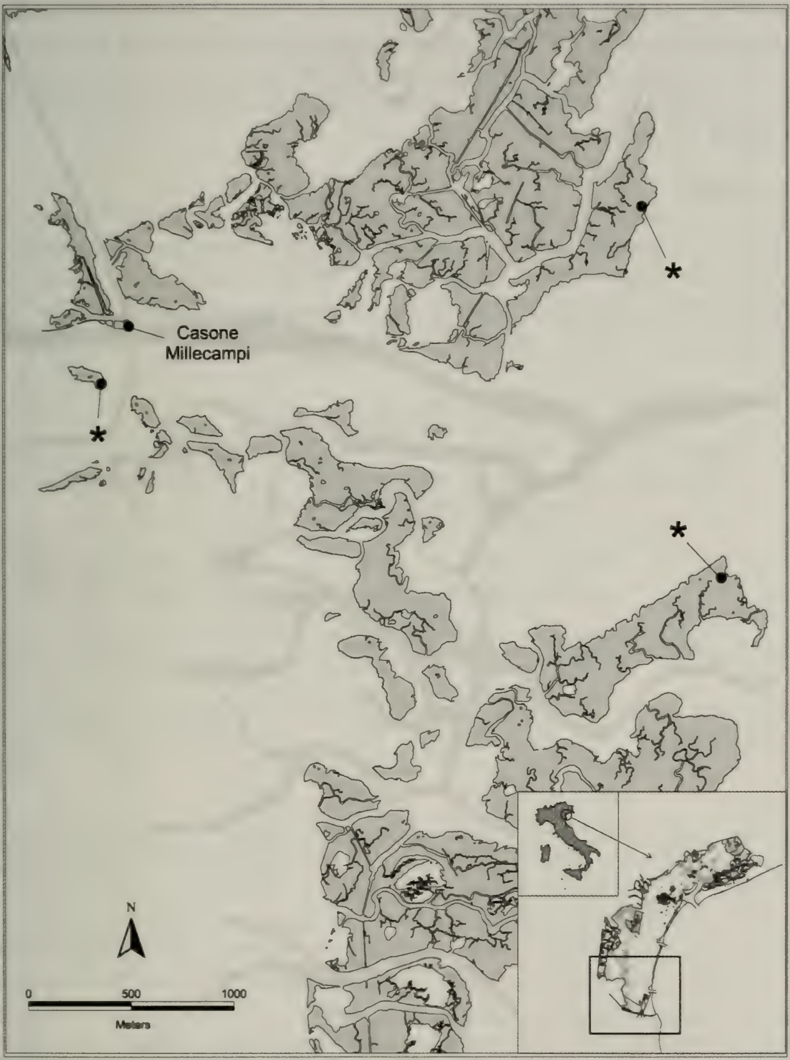
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Figure 1. Study area, with saltmarshes in grey; location of Redshank *Tringa totanus* colonies indicated with an asterisk.

Results

A total 163 birds were trapped, 55 males and 108 females. Of these, two males (3.7% of the captured males) were trapped twice, after one and three years; eight females (8%) were also recaptured, 1–7 years later. Table 1 shows the means of six measurements taken in the field of three different populations of Redshanks, in Venice, Britain and Denmark. Inter-sex differences in the three groups were highly significant (ANOVA, $p<0.001$ for weight, wing, tail and bill length; $p<0.01$ for tarsus length and tarsus width).

Measurements

Weight.—In males no significant difference was found between those from the Venetian lagoon and the British population, although both were very significantly different from Danish birds (Table 1, Fig. 2). In females there was a highly significant difference ($p<0.0001$) between all three populations (Fig. 2). Table 2 shows the mean weights of male and female Venetian Redshanks over eight years,

TABLE 1

Field measurements for three Redshank *Tringa totanus* breeding populations. Means that are not statistically different share the same letter. ANOVA and Tukey HSD test for unequal N, $p<0.05$.

Males		Weight	Wing	Tail	Bill	Tarsus length	Tarsus width
		$F_{2,1445}=29.9$	$F_{2,1450}=24.5$	$F_{2,1419}=12.2$	$F_{2,1427}=15.3$	$F_{2,1451}=203.9$	$F_{2,1348}=19.3$
Venetian Lagoon	Mean	128.98a	161.7a	64.8a	43.2a	54.2a	2.3a
	S.E.	1.01	0.48	0.29	0.26	0.27	0.01
	n	55	55	55	55	55	55
Ribble Marshes UK	Mean	126.7a	164.8b	65a	41.1b	47.9b	2.42b
	S. E.	0.2	0.11	0.10	0.08	0.06	0.003
	n	1375	1380	1349	1357	1381	1328
Tipperne Denmark	Mean	113.0b	160.8a	60.5b	41.9b	48.6b	2.26c
	S.E.	5.4	0.56	1.03	0.46	0.56	0.03
	n	17	17	17	17	17	17
Females		Weight	Wing	Tail	Bill	Tarsus length	Tarsus width
		$F_{2,1479}=22.1$	$F_{2,1496}=29.2$	$F_{2,1473}=5.17$	$F_{2,1468}=36.85$	$F_{2,1494}=433.7$	$F_{2,1439}=24.27$
Venetian Lagoon	Mean	139.6a	165.4a	66.2a	43.9a	55.0a	2.38a
	S.E.	1.24	0.36	0.25	0.18	0.23	0.01
	n	108	108	108	108	108	108
Ribble Marshes UK	Mean	134.3b	167.9b	66a	42.1b	48.4b	2.46b
	S. E.	0.2	0.11	0.12	0.06	0.06	0.003
	n	1357	1374	1351.0	1346	1372	1317
Tipperne Denmark	Mean	129c	163.4a	62.5b	43.4a	50.3c	2.41a
	S. E.	4	0.86	0.91	0.42	0.49	0.02
	n	17	17	17	17	17	17

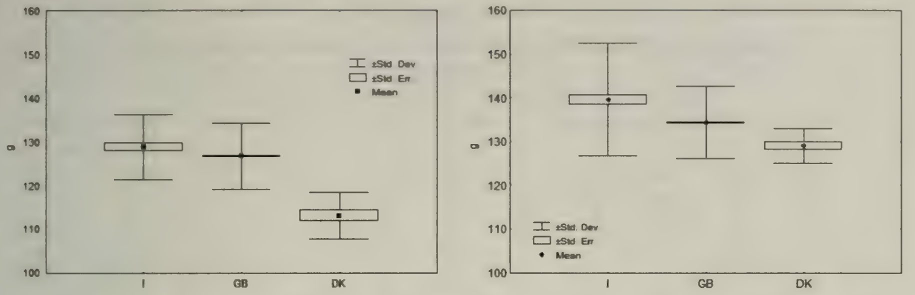

Figure 2. Weights of Redshanks (male above, female below) from the Lagoon of Venice (I), Britain (GB) and Denmark (DK)

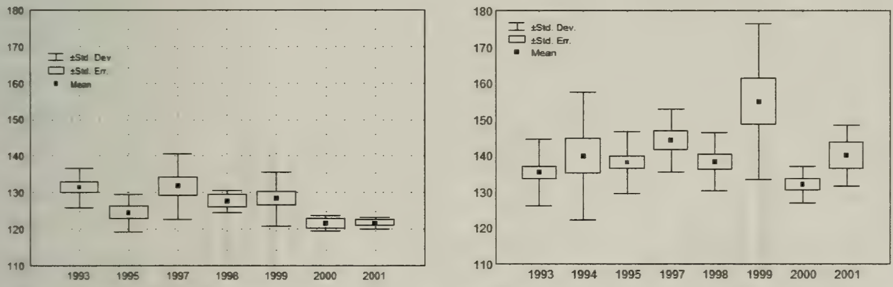

Figure 3. Weights of Redshanks (males above, females below) breeding in the Lagoon of Venice; a single male from 1994 is not included.

together with a total mean weight and ranges. These data show significant differences between years only for females (Fig. 3; ANOVA test; for males, a single bird from 1994 not included, $F_{6,47}=2.16$, $p>0.05$; for females, $F_{7,100}=3.95$, $p<0.001$). More extensive British data relating to the trapping of 2,755 birds over a period of 16 years (Hale in prep.) show very significant differences in weight between years, and it is likely that similar differences might occur in the Venetian population, were the data more extensive. Data from the Venetian lagoon indicate a mean difference of some 10 g in males and 22 g in females between years, and there were ranges of 35 g in males and 70 g in females between the lightest and heaviest individuals (Fig. 4). Eight of the ten retrapped birds showed little weight variation between seasons, but one had gained 17% over four seasons and another lost 22% over five seasons (Table 3). Fig. 3 shows that males and females do not always gain weight at the same rate in the same season, but this may be due to their feeding in different areas. The mean for all years shows a difference of 10.8 g between the sexes (Table 1), but this varied between 3.9 g in 1993 and 26.6 g in 1999 (Table 2).

TABLE 2
Weights (mean and standard error, in g) of Venetian Redshanks *Tringa totanus* in different years.

	1993	1994	1995	1997	1998	1999	2000	2001	Mean (all years)
Males	**131,4**	**146**	**124.5**	**131.7**	**128**	**128.3**	**121.5**	**121.7**	**128.8**
S.E.	1.5	2.9	1.8	2.7	1.8	1.9	1.5	0.9	1
n	13	1	8	11	2	15	2	3	55
Range	125–139		114–130	118–149	125–131	117–143	120–123	120–123	114–149
Females	**135.3**	**139.8**	**138.1**	**144.3**	**138.3**	**154.9**	**132**	**140**	**139.6**
S.E.	1.8	4.9	1.8	2.7	2.2	6.5	1.7	3.8	1.2
n	25	13	22	10	13	11	9	5	108
Range	121–154	122–174	120–155	134–164	127–160	132–190	127–138	130–151	120–190

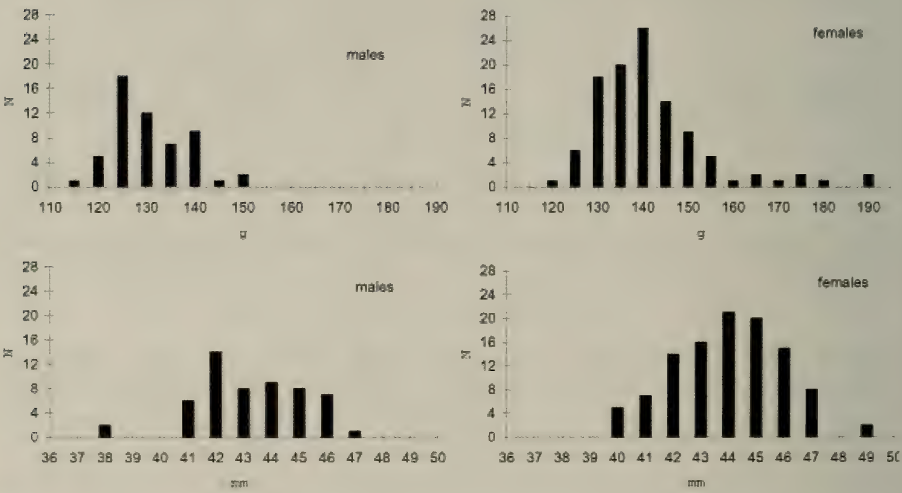

Figure 4. Weight (above) and bill (below) measurements for male and female Redshanks *Tringa totanus* breeding in the Lagoon of Venice.

Wing length.—Mean wing length of Italian birds (Table 1, Fig. 5) is not significantly different from that of Danish birds, but is significantly smaller than that of Redshank from the British Isles (Table 1) in both males and females (Tukey HSD test: $p<0.0001$).

Bill length.—Bill length (Table 1, Fig. 4) is greatest in the Venetian population and shortest in the British population, with significant difference between them (Tukey HSD test: $p<0.001$) in both sexes. Danish males are not significantly

TABLE 3

Retrapped birds; comparison of measurements (mm) and feather counts.
Dk = Chocolate-brown birds; Lt = Pale grey birds; Br = Cinnamon birds;
F = Full breeding plumage; P = Partial breeding plumage.

Ring no.	Date	Weight	Wing	Tail	Bill	Tarsus length	Tarsus width	Mantle	Breast	Scapulars	Secondaries	Morph
U21822	1993	127	165	65	43.5	56	2.34	27	18	9+9	6+6	Dk P
Female	1995	121	165	68	42	53	2.3	30	18	8+8	5+5	Dk F
U29493	1995	152	166	68	44	58	2.36	25	23	8+8	4+3	Lt P
Female	1997	148	169	67	42	53	2.35	25	26	8+8	5+4	Lt P
U41102	1997	145	162	67	43	53	2.32	22	20	8+8	4+4	Lt P
Female	1998	141	162	68	44.5	55	2.35	30	30	8+8	6+8	Lt F
U29474	1995	142	169	68	44	55	2.39	18	14	4+4	3+4	Br P
Female	1999	166	167	66.5	46	55	2.5	16	12	2+2	6+8	Br P
U29464	1994	162	165	66	44	56	2.43	27	22	8+8	7+7	Lt P
Female	1999	136	165	66.5	44	55	2.43	25	28	9+9	6+6	Lt P
U41260	1998	127	168.5	66	43	52	2.36	30	18	8+8	4+4	Dk F
Female	1999	134	166	65	44	52	2.35	15	30	9+9	5+5	Dk P
U41262	1998	139	170	66	43	57.5	2.39	30	25	8+8	4+5	Dk F
Female	2000	138	171	66	43	56	2.35	20	9	5+5	2+2	Dk P
U41109	1997	125	155	67	44	54	2.33	14	22	5+5	2+2	Lt P
Male	2000	123	157	64	45	55.5	2.34	5	7	1+2	1+1	Dk P
U21820	1993	122	163	65	42	53	2.22	33	25	9+9	4+4	Dk F
Female	2000	124	165	62	43	53	2.31	20	22	8+8	4+4	Dk P
U51943	2000	120	161	61	42	54	2.27	18	26	6+6	3+3	Dk P
Male	2001	123	161	63	42	52.5	2.3	15	8	5+5	0+1	Dk P

different from British males, and there is no significant difference between Venetian and Danish females.

Tail length.—There is no significant difference in tail length (Table 1, Fig. 5) between Italian and British Redshank, but Danish birds have a significantly shorter tail (Table 1; Tukey HSD test: $p<0.001$) in both sexes.

Tarsus length.—The largest and most significant difference occurs in tarsus length (Table 1, Fig. 6), where the Venetian population is on average more than 6 mm longer in both sexes than British birds, and more than 4.5 mm longer than Danish birds (Tukey HSD test: $p< 0.01$).

Tarsus width.—The British population has a significantly (Tukey HSD test: $p< 0.01$) broader, heavier tarsus than Venetian birds (Table 1, Fig. 6) in both sexes and in this respect is similar to Icelandic Redshank. Danish males have a significantly

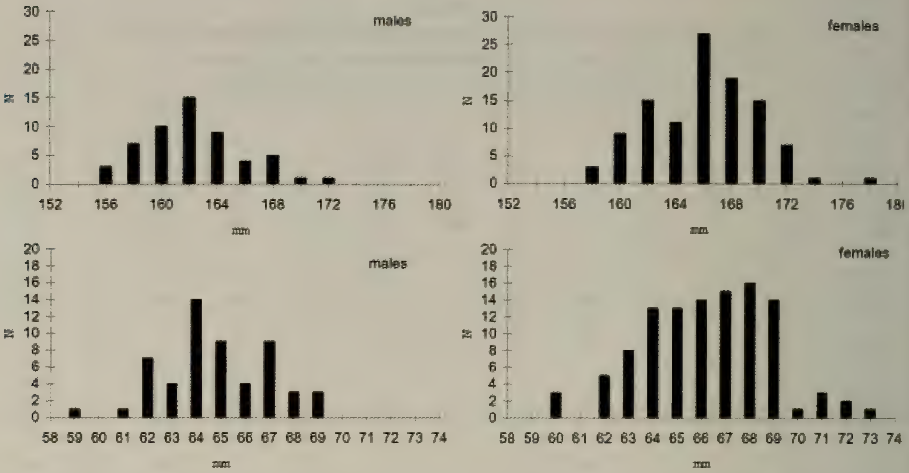

Figure 5. Wing (above) and tail (below) measurements for male and female Redshanks *Tringa totanus* breeding in the Lagoon of Venice.

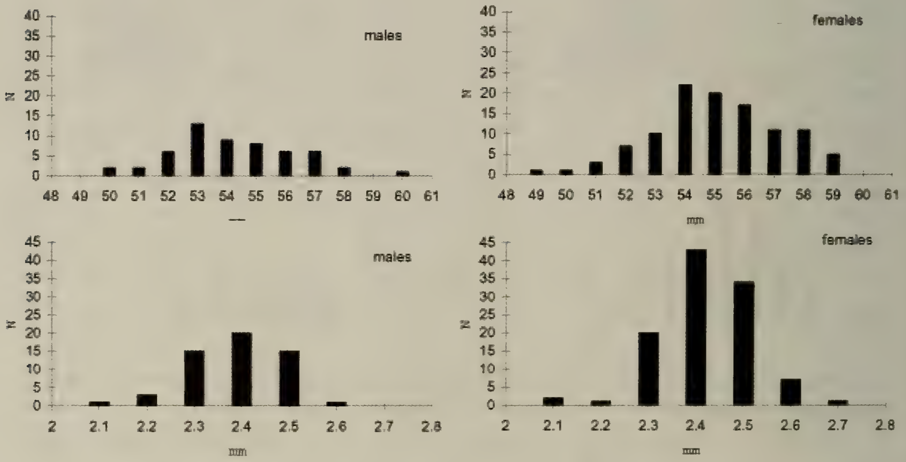

Figure 6. Tarsus length (above) and tarsus width (below) measurements for male and female Redshanks *Tringa totanus* breeding in the Lagoon of Venice.

narrower tarsus than either of the other populations (Tukey HSD test: $p < 0.01$). In females there is no significant difference in width between Venetian and Danish birds, but there is a significant difference between both populations and British Redshank (Tukey HSD test: $p < 0.01$).

TABLE 4
Distribution of plumage types in live Venetian Redshanks *Tringa totanus* and Italian museum specimens. BP = breeding plumage.

	DARK BROWN		PALE GREY		CINNAMON	
	Full BP	Partial BP	Full BP	Partial BP	Full BP	Partial BP
Museum skins	2	1	2	3	0	3
	27%		45%		27%	
Lagoon of Venice	22	65	10	48	0	18
1993–2001	53%		36%		11%	

Plumage variation

Of the 163 breeding Redshank trapped on the Venetian lagoon (including the ten retraps) only 32 had full breeding plumage (Table 4). In all others (131) some winter feathers were retained, and the extent of breeding plumage in Venetian Redshanks was very similar to Danish birds. Of the six counts taken, there was no significant difference between Italian and Danish males, but there was significant

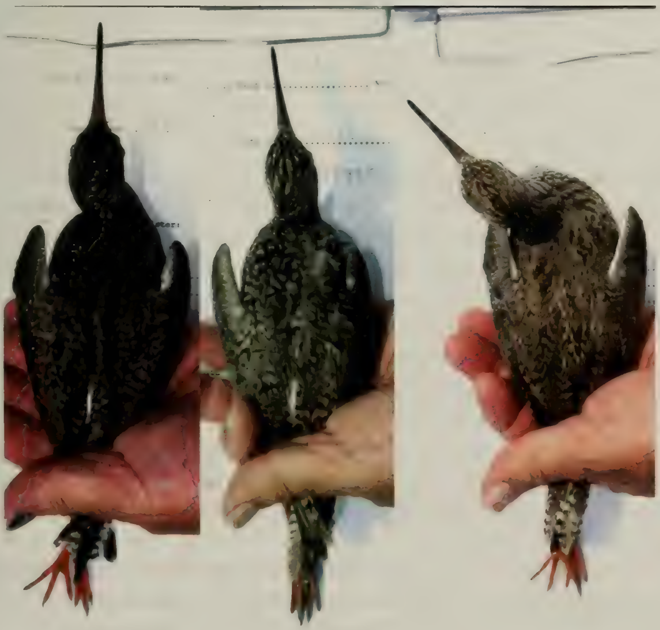

Figure 7. The colour forms of Redshank *Tringa totanus* breeding in the Lagoon of Venice; left to right i) chocolate-brown morph, ii) pale grey morph, and iii) cinnamon morph.

TABLE 5
Breeding plumage counts in three populations of Redshanks *Tringa totanus*.

		Mantle (max. 30)	**Breast (max. 30)**	**Scapulars (max. 16)**	**Secondaries (max. 16)**
Lagoon of Venice	Males *n*=56	**18.63**	**18.72**	**13.19**	**6.13**
	S.E.	1.15	0.94	0.26	0.27
	Females *n*=108	**19.6**	**18**	**13.34**	**7.17**
	S.E.	0.78	0.69	0.22	0.21
Ribble Marshes UK	Males *n*=1,353	**6.9**	**7.5**	**5.03**	**0.96**
	S.E.	0.18	0.18	0.06	0.03
	Females *n*=1.346	**6.8**	**6.63**	**5.52**	**0.99**
	S.E.	0.17	0.16	0.06	0.03
Tipperne Denmark	Males *n*=17	**17.6**	**18.4**	**12.5**	**6**
	S.E.	2.43	1.64	0.57	0.47
	Females *n*=17	**14.5**	**16.7**	**7.82**	**5.82**
	S.E.	1.93	1.84	0.48	0.42

difference between these populations and British birds in all six counts (Tukey HSD test: $p<0.01$). In females the breast count and that of the left secondaries showed a significant difference (Tukey HSD test: $p<0.01$) between Danish and Italian birds on the one hand and British birds on the other; counts of the mantle, right scapulars and right secondaries showed significant differences between all three populations (Tukey HSD test: $p<0.01$), and in the case of the left scapulars Italian birds were significantly different (a larger count) from those of the other populations (Table 5).

Three colour forms could be recognised among trapped birds (153) in Venice (Table 4, Fig. 7); a small proportion (18) resembled dark cinnamon-coloured birds from the British Isles, whilst the majority (135) were chocolate-brown (87) and grey-brown (58) birds—dark and light forms of the nominate race (Harrison 1944).

Ten retraps were made during the present work, seven of which had less breeding plumage in years after the initial trapping, two had more breeding plumage and one showed no change after two years. Whilst there is no difficulty separating chocolate-brown from pale grey morphs in full breeding plumage, it is more difficult when only a small amount of breeding plumage is present and, in these circumstances, cinnamon-coloured birds are not easily separable from the grey morph. In one case, a retrapped bird (U411099) was allocated to the grey-

TABLE 6
Comparison of mensural data (mean and s.d., in mm) of southern breeding populations of Redshank *Tringa totanus*.

	Lagoon of Venice live birds	**Italy**	**Bulgaria/Greece** specimens	**Spain**
Males				
Wing length	**161.7**	**161.4**	**158.7**	**157.8**
	3.6	2.2	3.0	3.6
Tail length	**64.8**	**61.6**	**64**	**63.4**
	2.2	1.5	1.6	2.6
Bill length	**43.2**	**42.2**	**40.5**	**43**
	1.9	1.35	2.15	2.4
Tarsus length	**54.2**	**50.2**	**50.7**	**50.8**
	2	2.08	1.7	2.8
Tarsus width	**2.3**	**2.19**	**2.14**	**2.13**
	0.1	0.09	0.05	0.1
n	55	5	6	10
Females				
Wing length	**165.4**	**160.8**	**161.3**	**159.1**
	0.36	3.54	2.2	1.8
Tail length	**66.2**	**65.4**	**62.8**	**61.9**
	0.25	1.8	3.2	2.3
Bill length	**43.9**	**48.29**	**43.9**	**44.5**
	0.19	5.3	2.2	1.1
Tarsus length	**54.9**	**49.01**	**51.9**	**51.1**
	0.23	1.4	4	2.5
Tarsus width	**2.38**	**2.19**	**2.12**	**2.09**
	0.01	0.04	0.1	0.1
n	108	7*	4	5

*= 6 for wing length

brown form on initial capture, but was clearly chocolate-brown, with significantly more breeding plumage, three years later (Table 3). The other nine retraps exhibited the same type of breeding plumage as when first trapped, suggesting the possibility of moulting to a different form of breeding plumage, at least between the two forms in question. Further work is needed to establish whether the explanation is really the misidentification of the colour form due to the small amount of breeding plumage, or the less likely scenario of a colour change.

Comparison with museum specimens

When working with specimens there is always the possibility that birds collected during the breeding season may not necessarily be breeders. In the case of the 11 'Italian' skins examined by Hale (1971) none was labelled as certain breeders. The present work, during which known breeders were examined, provides a basis on which to check how representative of the Italian breeding population was the museum sample (Table 6).

Based on the data in Table 6, there is no reason to consider the museum sample to be of birds other than breeders, but the long series of known breeders shows that there is probably a much higher proportion of chocolate-brown birds in the breeding population (53%) and a smaller proportion of cinnamon birds (11%). The Venetian breeding population is more like that of Spain in the distribution of the different colour forms than suggested by the museum sample. The ratio of 87 : 58 (chocolate-brown : grey morph) is not different from the ratio of 11 : 5 in Spanish skins (Yates corrected $P^2=0.17$, $p>0.05$). Samples from Greece and Bulgaria were too few to provide meaningful comparison. However, it is probable that all southern European breeders have a similar distribution of colour morphs throughout the Mediterranean, with the chocolate-brown form predominating.

Given drying in skins there is also a close similarity in measurements, except tarsus length. As it is bone length that is being measured, a contraction of 3.9 mm in males and 5.8 mm in females would not be expected (Table 6). Comparing the live Venetian population with Italian skins, for males, wing, tail and bill lengths do not show significant differences (Kruskall-Wallis test, $P^2=5.0$, 2.7, 1.7, $p>0.05$ in all cases); contrastingly, tarsus length and tarsus width show significant differences, with Venetian birds having longer and thicker tarsi (Kruskall-Wallis test, $P^2=14.8$ and 26.7 respectively; $p<0.01$ in both). Among females only tarsus width shows a significant difference (Kruskall-Wallis test: $P^2=10.1$, $p<0.05$), with Venetian birds having thicker tarsi, but this is probably accounted for in both sexes by drying in skins. With the exception of tarsus length, exceptionally long in Venetian birds, measurements and plumage characteristics of Venetian birds are similar to other southern breeders.

Discussion

Immediately after egg laying Venetian Redshanks are heavier than other sampled populations (British and Danish, Table 1), although Icelandic Redshanks are heaviest (males *c.*140 g, females 167 g: Hale *in* Cramp & Simmons 1983). British breeders, which are significantly longer winged (Table 1), are lighter at this time (males 126.7 ± 0.2 g, females 134.3 ± 0.2 g). British birds are largely sedentary in winter (Hale 1973) and these weights probably reflect late-winter/early-spring feeding conditions; this might indicate much different feeding conditions for the Italian population, either in the Mediterranean or in Africa. Thus far, no recoveries away from the ringing site of the 153 individuals ringed during this work have been reported.

Danish Redshanks, which have very similar wing length to Venetian birds (Table 1), weigh significantly lighter in May, males having a mean weight of 113 ± 1.3 g, and females 129 ± 0.98 g. Whilst these weights may reflect longer migration in Danish birds, other explanations are possible, e.g. little winter movement in a proportion of the Danish population that experiences different (possibly poorer) feeding conditions. Venetian Redshanks are undoubtedly heavy relative to wing length, which is clearly shown in Fig. 2, where separate male and female comparison is made between British, Danish and Italian birds. In both sexes there is significant difference in weight between the three populations.

Weight in Redshanks varies during the year (Hale 1980), peaking in autumn, decreasing in early winter and increasing again in late winter/early spring. Spring weights are affected by winter feeding and individuals undertaking long migrations use reserves and are therefore lighter in weight. Clearly, both feeding and migration conditions vary annually, thus variation in weights might be expected between years. However, no significant differences in weight were detected in either sex over a 16-year period in the British study (Hale in prep.), making it likely that breeding-season weight is a population characteristic uninfluenced by environmental factors.

Wing length of Venetian birds is unusually short considering weight and in this respect they resemble Scandinavian birds rather than the British/Icelandic complex (Hale 1971), suggesting a closer relationship to the typical form than to *T. t. robusta* or the British population. The uniquely long tarsus of Venetian birds is difficult to explain. It is possibly associated with feeding conditions in the lagoon, where fluctuations in tide height are much smaller than those experienced by birds outside the Mediterranean. Under these conditions tides expose much smaller mudflats, so that Venetian Redshanks may have to wade to obtain adequate food. In contrast, British Redshanks obtain the majority of their food from exposed mud (in estuarine-breeding populations) and from the ground surface (inland).

It has been suggested (Hale 1971) that the lack of breeding plumage is characteristic of the western hybrid zone in the Redshank, and the findings of the present study in this respect agree well with those from the study of specimens. Also in agreement with previous work is the distribution of the colour forms (Fig. 7), three being recognisable: i) chocolate-brown birds, ii) grey-brown birds, and iii) cinnamon birds similar to those breeding in the British Isles; the former two groups are the dark and light phases in continental birds recognised by Harrison (1944). However, that these two forms co-exist lends support to the theory of a Western European hybrid zone. Hale (1971) suggested that the hybrid zone spread north during the 19th century and that birds typical of the hybrid zone replaced the original form (chocolate-brown). Whilst prior to 1900 more than 90% of northern Scandinavian birds were the chocolate-brown morph, post-1900 this had reduced to 60%. Interestingly, Ottvall (2002) found genetic differences between northern and southern populations of Redshank in Scandinavia, which is consistent with the morphological data, and the results also suggest that southern populations sampled belong to a panmictic grouping. In Italy, in the present day, more than 50% of breeders are the chocolate-brown form (Table 4), which seems to be disappearing from Scandinavia.

Hale (in prep.) will show that in Redshanks breeding in northern England the degree of breeding plumage, and consequently the number of retained winter feathers, may vary in individuals between years. This is not age-related, as the extent of breeding plumage may increase or decrease annually, as it does in Venetian birds (Table 3). Nor is it related to early breeding, as suggested by Whitfield (2003), but it is apparently related to distance migrated, with those sedentary in winter showing little breeding plumage, whereas migrants attain more breeding plumage the following season the further they travel.

The small amount of breeding plumage that some Venetian birds attain may indicate that they winter in the Mediterranean, whereas those with very full breeding plumage probably penetrate far south in Africa, e.g. Nigeria and Cameroon (Hale 1973). Thus far, no recoveries have been reported for breeders ringed in Venice, but the higher mean counts of breeding plumage in these birds suggests that they undertake a longer migration, on average, than do British birds.

Linné (1766) originally described *Tringa totanus* as having a grey-brown body and, as previously noted (Hale 1971), this cannot refer to chocolate-brown birds of northern Scandinavia and the predominant morph in Venice. Since these are apparently not the typical form it is unjustifiable to refer to them as *T. t. totanus* unless, as suggested earlier as a possibility, an individual may adopt characteristics of both morphs during its lifetime. As three morphs co-occur in the Venetian population, at the southern fringe of an apparent hybrid zone, these birds are probably more correctly referred to as *T. t. totanus* x *ussuriensis*.

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Remarks on Sichuan Wood Owl *Strix uralensis davidi* from observations in south-west China

by Wolfgang Scherzinger

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Sichuan Wood Owl (Père David's Owl) *Strix uralensis davidi* was described, by Sharpe (1875) as *Syrnium davidi*, from the type, a male, taken at Mupin, in Sichuan province, China, and named for the French missionary, Armand David, who discovered this owl during his first collecting trip to western China, in 1866. (J. Verreaux labelled the specimen *Ptynx fulvescens*, considering it to be an example of the rufous subspecies of Ural Owl, known from Japan (now *Strix uralensis fuscescens*), but in older literature it also acquired the synonym *Syrnium rufescens*. This led to much confusion, as *Strix fulvescens* (previously *Syrnium fulvescens* Sclater & Salvin) is a quite different owl species from Middle America, as Sharpe (1875) had already noted.) Even now, our knowledge of Sichuan Wood Owl's distribution, ecology, reproduction, voice and behaviour is very poor. Consequently, data on status, conservation and taxonomy are rather vague (Holt *et al.* 1999, König *et al.* 1999). Most descriptions of this owl and its taxonomy are traceable to observations and specimens from the late-19th and early-20th centuries. Published distribution maps are still, of necessity, rather vague, but this owl is known to inhabit primeval forests in montane Sichuan and south-east Qinghai (Cheng Tso-hsin 1987), and although not previously known from Gansu (Liu Naifa 1995), where this owl was first detected in 1995 (Sun *et al.* 2001), recent records indicate that it occurs in extensive woodland across southern Gansu, as far as the border with

Sichuan (Y. H. Sun pers. comm.). Given that its range appears limited to high-elevation coniferous forests in western China and eastern Tibet, this owl is considered a relict of most recent glacial events (Voous 1962).

Sichuan Wood Owl has always been considered rare (Weigold *in* Stresemann 1923, Holt *et al.* 1999), and in China is listed in category II of the list of nationally threatened species (Zheng Guangmei & Wang Qishan 1998). Its isolation and apparent rarity might mean that it demands listing as globally threatened, as Vulnerable (Collar *et al.* 1994), but subsequently BirdLife International (2000) elected to treat *davidi* as a subspecies, consequently its global conservation status has not been evaluated since. Availability of suitable habitat is strictly limited through fragmentation of old-growth coniferous forests due to the natural morphology of the mountains, as well as extensive clear-cutting and grazing over much of montane Sichuan, especially the eastern Qinghai-Tibetan plateau, in the 1970s (Liu Naifa pers. comm.). Nowadays, the country is starting to maintain its woodland areas and encourage reforestation (in response to increasing erosion and flooding), and recently, China's ministry for land use and environment decreed a logging ban for nearly all montane forests, in some areas even for bamboo cutting, especially in watersheds. Furthermore many reserves have been declared, some with a status comparable to national parks (e.g. Jiuzhaigou Reserve), others as strict reserves, accessible only by permit.

Study area

Lianhuashan Nature Reserve (34°56'–58'N, 103°44'–48'E) is in Gansu province, south of the capital Lanzhou, at the east edge of the Qinghai-Tibetan Plateau. The reserve is named after a conspicuous rock summit, at nearly 3,500 m, visited by thousands of Buddhist pilgrims annually. Covering *c.*120 km^2, the reserve includes dry south-facing slopes with thickets of buckthorn, willow, wild rose, and scattered firs, as well as alpine meadows and, on shaded slopes, moist coniferous forest, rich in gaps dominated by fir and spruce, with bamboo, wild rose, birch, mountain ash, many bushes and, at higher elevations, rhododendron. Of the total reserve area, non-fragmented woodland covers *c.*47 km^2, and the treeline is above 3,000 m. Due to heavy logging in the 1970s, stands of old-growth forest persist only on very steep slopes, exposed ridges, and within inaccessible canyons. Following designation as a nature reserve in 1983, human utilisation has been restricted to yak grazing, seasonal bamboo cutting and some logging. Bird species include Chinese Grouse *Bonasa sewerzowi*, Blood Pheasant *Ithaginis cruentus*, Blue Eared Pheasant *Crossoptilon auritum*, Ring-necked Pheasant *Phasianus colchicus*, Chestnut-throated Partridge *Tetraophasis obscurus*, Black Woodpecker *Dryocopus martius*, Golden Eagle *Aquila chrysaetos*, Lammergeier *Gypaetus barbatus*, Eagle Owl *Bubo bubo* and Tengmalm's Owl *Aegolius funereus beickianus*. Lianhuashan Nature Reserve represents an impressive relict of natural woodland in montane south-west China.

Satellite data have permitted maps of the actual distribution of forest to be drawn, which can be used to plan reforestation and the creation of corridors between remnant forest patches (Klaus *et al.* 2001). Through a grant from the BP Conservation Programme, suitable nest boxes for the owl were erected in the reserve in 2002–03, providing nesting sites even in younger forest stands, and also affording possibilities for observing the reproductive cycle.

In April–May 1995, May–June 1997 and June–July 1999 I made field observations and tape-recordings of at least one pair of Sichuan Wood Owls in the reserve. I also made simple tests of the responsiveness of these owls to my imitation of the territorial song of Ural Owl from Europe, both to test the response of previously silent owls and to determine the reaction of owls already engaged in territorial display. Though preliminary, my observations provide new information on the behaviour of this owl and, in particular, analysis of the vocalisation data permits comparison with the vocal repertoire of other forms of Ural Owl with which I am reasonably familiar.

Description

Field observations were mostly made in the twilight hours, but on 13 April 1995, I discovered a male in daylight (Fig. 1). A detailed description was obtained from a specimen taken in the reserve and retained in a small museum at the reserve administration building. Although poorly mounted, it clearly has blackish-brown scapulars with distinct white dots, a long tail with its central feathers a near-uniform blackish brown and barely marked (Fig. 2a), rather coarse longitudinal underparts

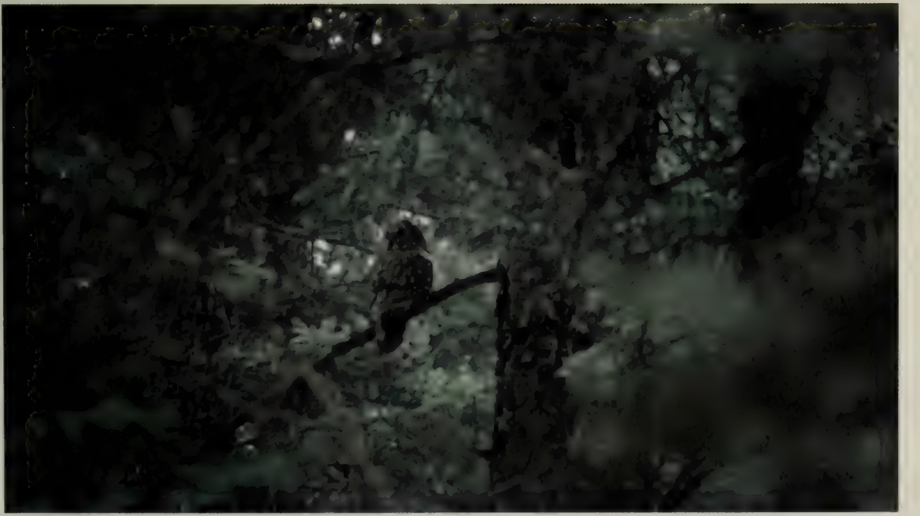
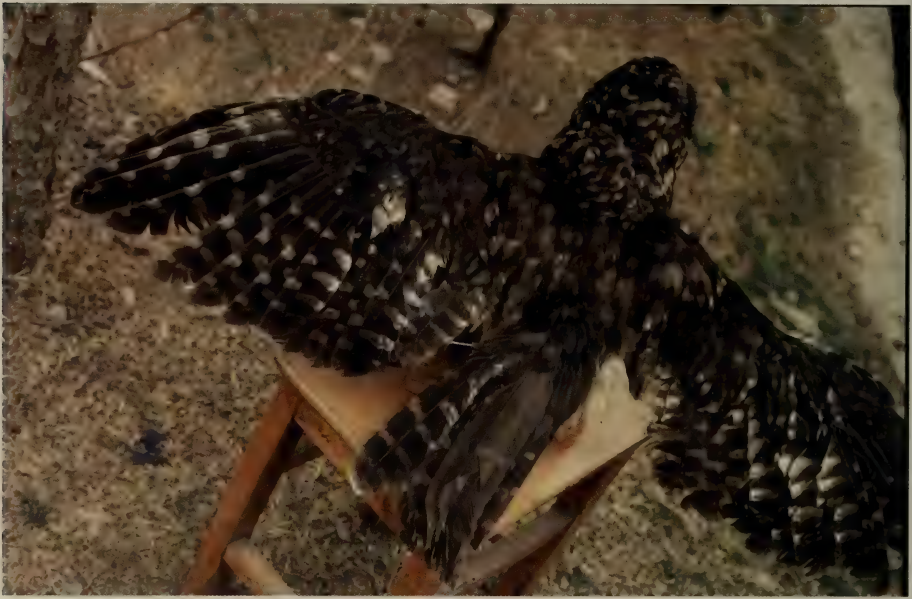


Figure 1. Adult Sichuan Wood Owl *Strix uralensis davidi* (Wolfgang Scherzinger)



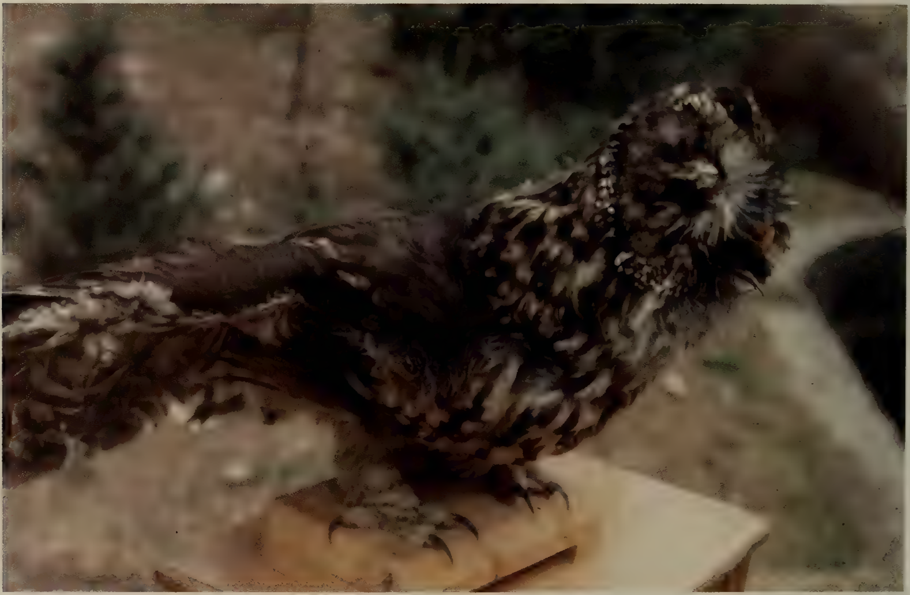


Figure 2a (top). Specimen of Sichuan Wood Owl *Strix uralensis davidi* from Lianhuashan reserve. The overall dark coloration of the upperparts and scapulars, and the virtually unmarked central tail feathers, are visible (Wolfgang Scherzinger)

Figure 2b (bottom). Specimen of Sichuan Wood Owl *Strix uralensis davidi* from Lianhuashan reserve. Note the species-specific characters, such as the greyish facial disc, framed in dark brown with white perimeter spots, and the yellowish bill (Wolfgang Scherzinger) streaking, a dark frame to the facial disc contrasting with a white-dotted perimeter and whitish stripe either side of the brown forehead (Fig. 2b). The latter pattern is atypical of most forms of Ural Owl *Strix uralensis* but occurs in Japanese *S. u. fuscescens* (Miyazaki 1990) and in Tawny Owl *S. aluco*.

In body size and morphology, Sichuan Wood Owl strongly recalls Ural Owl *S. u. liturata*, which also has coarse underparts streaking and almond-shaped blackish-brown eyes set within a distinct facial disc. However, the Chinese form is overall much darker, especially the blackish-brown scapulars. Furthermore, Sharpe (1875) noted the fine concentric lines in the facial disc, which he considered analogous to the pattern in Great Grey Owl *S. nebulosa*, and plain uppertail-coverts. Moreover, specimens have fine scribble-like markings on the central rectrices, which are uniformly dark, in contrast to the heavily barred outer feathers. Tail-feathers of other Ural Owl subspecies are dark brown, with 5–7 pale bars. Published illustrations are mostly based on specimens in Dresden and Berlin, sometimes incorrectly (Eck & Busse 1973, König *et al.* 1999, Holt *et al.* 1999, MacKinnon & Phillipps 2000).

Observations and methods

All field records were made in the main valley of Lianhuashan reserve, which stretches from a saddle at the base of Three Sisters peak in the west (at *c.*2,900 m, with dense old-growth coniferous forest on a steep slope, and dry meadows with scattered scrub and thorn bushes) to a swampy area beside a small creek in the east (with dense conifers and wet meadows, surrounded by thickets of willow). The eastern part also has steep slopes, with patchy bushes and young trees, interspersed by rocky areas and screes (2,850–3,000 m). On calm evenings owls could be heard over the full length of the valley, *c.*1.5 km. The entire area used by the pair measures a minimum 200 ha. In summary, over the three years, I made 14 acoustic and six visual records of the male, and three acoustic and four visual records of the female, but no confirmation of nesting was possible. My experiments concerning the responsiveness of Sichuan Wood Owl to a whistled imitation of the territorial song of Ural Owl demonstrated the owls to be generally highly responsive to the voice of the European bird, both when previously silent and when already engaged in territorial activity.

Vocal comparison of Ural Owl and Sichuan Wood Owl

Descriptions of the vocalisations of Sichuan Wood Owl are mostly rather unspecific, e.g. *kollol-kollol* (Weigold *in* Stresemann 1923), a barking *kbau-kbau* by the male and hoarse *kee-wi* uttered by the female (König *et al.* 1999) or an extended, tremulous howling (Hume & Boyer 1991), most of these authors emphasising the broad vocal conformity with Ural Owl. Sibley (1996) noted the similarity of the call notes with the Japanese subspecies *Strix u. fuscescens*, based on an observation by B. F. King.

Owls are suitable subjects for a taxonomic comparison of vocalisations, as they represent innate signals (see König 1994). Here, I compare the voice of Sichuan Wood Owl with the well-known repertoire of Ural Owl, as described by Scherzinger (1980) from field observations in eastern Slovakia (*S. u. macroura*), from tape-recordings of captive owls of Swedish origin (*S. u. liturata*) and more than 140 captive-bred owls released as part of a reintroduction project in the Bavarian Forest National Park (Germany).

The territorial song of male Ural Owl comprises three syllables. The first has two elements (*buhuu*, intonation at end) and is followed, after an interval of at least 1–2 seconds, by the second (of 3–4 elements, a short *buhulo*), and, shortly afterwards, by the third (a near-barking *buhu*, with up to four elements in quick succession: see Fig. 3). The sonogram of a typical, complete song of male Ural Owl reveals the duration of the strophe as 2.3 seconds (first syllable 0.4 seconds, second and third syllables 0.4 seconds each). The frequency of the softly ascending and descending elements of the first syllable is 0.200–0.510 kHz and the second and third at 0.220–0.600 kHz (with maximum amplitude 0.450 and 0.580 kHz: Table 1).

At first glance, strophic structure in the territorial song of Sichuan Wood Owl closely resembles that of Ural Owl (Fig. 3). The male's song comprises two syllables (lasting 1.08 seconds on average; *N*=3), but the first syllable consists of a

TABLE 1

The vocal repertoire of adult Ural Owl *Strix uralensis liturata* comprises 13 different vocalisations, of which most also occur in Sichuan Wood Owl *S. u. davidi* and are usually strikingly similar.

Vocalisation	***Strix u. liturata***	***Strix u. davidi***
begging by nestlings	*chjit, ki.szip*	?
territorial song	*buhoo........buhulo..buhu* (typical = trisyllabic)	*uhoo.....buhubub* (typical = disyllabic)
short-distance song—a	first syllables of song	first syllables of song
short-distance song—b	repeats last song elements	repeats last song elements
nest-site demonstration	rising scale (up to eight syllables) *bu.bu.bu.bu.bu.bu....*	rising scale (up to five syllables) *bu.bu.bu.bu....*
female contact	*kuwätt, kwä*	high-pitched *kuwäch*
begging		strident *kuwäck*
long-distance note	barking *guä, hwa, wu*	barking (*wu*)
alarm note	*kwäck, chwä*	shrill *kuwack*
aggressive note	crying *korah*	crying *korah*
aggressive song	serial *korah* *guo, chrooh*	 *guo*
soft contact call	growling	?
feeding note	rattling *tschrrt*	?
fear twitter	chirping *twitter*	
mating twitter	*twitter*	
defence	hissing	
instrumental note	bill-snapping	(probably)

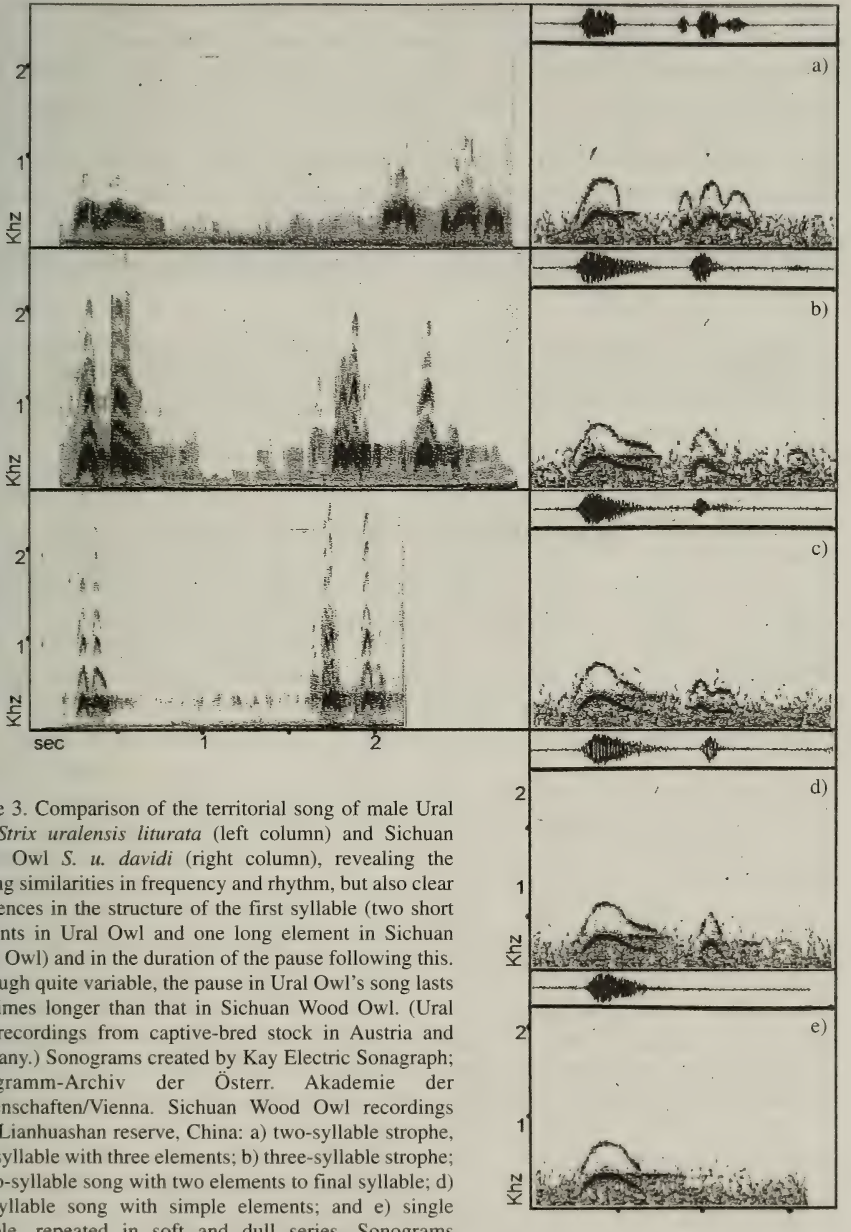


Figure 3. Comparison of the territorial song of male Ural Owl *Strix uralensis liturata* (left column) and Sichuan Wood Owl *S. u. davidi* (right column), revealing the striking similarities in frequency and rhythm, but also clear differences in the structure of the first syllable (two short elements in Ural Owl and one long element in Sichuan Wood Owl) and in the duration of the pause following this. Although quite variable, the pause in Ural Owl's song lasts 3–4 times longer than that in Sichuan Wood Owl. (Ural Owl recordings from captive-bred stock in Austria and Germany.) Sonograms created by Kay Electric Sonagraph; Sonagramm-Archiv der Österr. Akademie der Wissenschaften/Vienna. Sichuan Wood Owl recordings from Lianhuashan reserve, China: a) two-syllable strophe, final syllable with three elements; b) three-syllable strophe; c) two-syllable song with two elements to final syllable; d) two-syllable song with simple elements; and e) single syllable, repeated in soft and dull series. Sonograms created using Avisoft for PC, average intensity; H.-W. Helb (Univ. Kaiserslautern).

single element (a softly ascending and descending *uhoo*; duration 0.26–0.31 seconds). After a pause of just 0.34 seconds the second syllable of three elements follows (*buhububub*; duration 0.46–0.48 seconds). Frequency ranges at 0.207–0.390 kHz in the first and 0.213–0.370 kHz in the second syllable (centre of gravity 0.377 and 0.363 kHz, respectively; i.e. somewhat lower than in Ural Owl). Spontaneous song of the male usually was observed at the start of its daily activity, but mostly it called in response to my imitation of its song (e.g. on 4 and 7 May 1997 and 1 July 1999); singing occurred whilst roosting in the canopy or exposed on treetops, sometimes even in flight. In another type of territorial song, Sichuan Wood Owl

TABLE 2

Mean values for duration and frequency range of territorial song and nest-site demonstration in Ural Owl *Strix uralensis liturata* and Sichuan Wood Owl *S. u. davidi*: dt = overall duration of strophe, dt-1 = duration of syllable 1, dd-1 = duration of interval 1; df-1 = overall frequency of syllable 1, f-1a = max. frequency of syllable 1, f-1b = min. frequency of syllable 1, f-1max. = frequency of maximum power in syllable 1.

(means)	three syllables (*n*=3)	two syllables (*n*=3)	two syllables (*n*=5)	three syllables (*n*=4)	one syllable (*n*=8)	(means)	eight syllables (*n*=1)	4–5 syllables (*n*=11)
duration in sec								
dt-1	0.34	0.28	0.46	0.46		dt-1	0.09	
dd-1	1.27	0.34	0.25	0.2		dd-1	0.2	
dt-2	0.53	0.47	0.22	0.24				
dd-2				0.29		dd-7	0.1	
dt-3				0.18		dt-7	0.19	
dt	2.24	1.08	0.92	1.41	0.42	dt	1.6	1.35
frequency in kHz								
f-1a	0.497	0.39	0.386	0.375	0.375	f-1a	0.4	
f-1b	0.177	0.207	0.2	0.183	0.194	f-1b	0.12	
df-1	0.36	0.183	0.186	0.178	0.182	df-1	0.2	
f-1max	0.42	0.377	0.37	0.37	0.356	f-1max	0.3	
f-2a	0.56	0.37	0.284	0.343		f-3a		350
f-2b	0.2	0.213	0.186	0.185		f-3b		175
df-2	0.36	0.157	0.98	0.15				
f-2max	0.493	0.363	0.246	0.343		f-3max		347
f-3a				0.26		f-7a	0.5	
f-3b				0.17		f-7b	0.1	
df-3				0.9		df-7	0.3	
f-3max				0.26		f-7max	0.4	

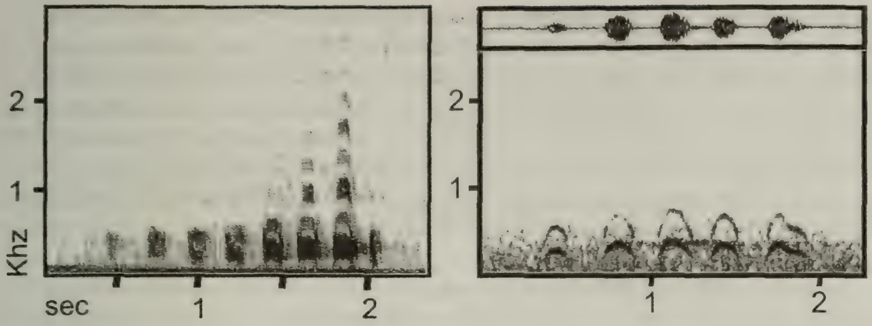


Figure 4. Nest-site demonstration in characteristic strophes of male Ural Owl *Strix uralensis liturata* (left) and Sichuan Wood Owl *Strix uralensis davidi* (right). Sonograms created using Avisoft for PC average intensity; H.-W. Helb (Univ. Kaiserslautern).

prolongs the first syllable (decreasing frequency; mean duration 0.46 seconds; *N*=5), when—to the human ear—it recalls the *bubo* call of Eagle Owl. After a short pause (0.22–0.28 seconds) the second syllable follows (1–2 elements, quickly subsiding; 0.15–0.27 seconds). The entire strophe of this song-type is shorter, lasting a mean 0.92 seconds, but frequencies are similar (see Table 2). A further variant song can be distinguished, which is virtually identical but with a third syllable like the second. The duration of the first syllable is 0.44–0.49 seconds, the next 0.20–0.29 seconds, but the third is somewhat shorter, at 0.13–0.24 seconds. The entire strophe lasts a mean 1.41 seconds (*N*=4), and frequencies are as in the second song-type.

Apart from varying the intervals, the male varies the strophes quite diversely, e.g. by repeating the first syllable alone (syllables soft and dull, at decreasing frequency) or repeating the last elements of the song twice. I observed such vocalisations in male Sichuan Wood Owl, especially in short-distance communication with the female. Concerning duration, structure and frequency, such softly ascending and extended syllables are like the first syllable of the second song-type (duration 0.42 seconds, frequency 0.194–0.375 kHz, with a mean centre of gravity at 0.356 kHz; *N*=8; Table 2). In certain situations, male Ural Owl also repeats the soft, rumbling notes of the first syllable of the territorial song or, less often, the second and/or third syllables separately (short-distance song in Table 1; given, e.g., in duet with the female, when offering prey or in pre-copulatory behaviour).

The close correspondence in vocalisations is also striking in the light rising scale of single notes that functions as nest-site demonstration in Ural Owl (Fig. 4). Indicating a high level of arousal, the male connects up to eight dull syllables of increasing length and intensity, with constant intervals (*bu.bu.bu.bu*; in a series of eight syllables the length of the shortest syllable was 0.09 seconds, of the longest

0.19 seconds; total strophe length 1.6 seconds). Because of this vocalisation's scale-like ascent, the frequency reaches 0.120–0.400 kHz in the first syllable, in the final one 0.100–0.500 kHz (and maximum intensity increases from 0.300 to 0.400 kHz). Male Sichuan Wood Owl also connects 4–5 syllables at regular intervals, the intensity softly increasing (*bu.bu.bu.bu*; Fig. 4). In 11 sonograms the mean duration of strophes is *c.*1.35 seconds (range 1.29–1.60 seconds), and the frequency ascends from 0.175 kHz, at the beginning of the strophe, to 0.350 kHz in the final, more vigorous syllable (maximum amplitude 0.340–0.350 kHz always occurs in the third syllable).

Moreover, the similarity in female contact calls in both owls is striking (see Table 1), at least to the human ear, as recordings of these calls are lacking. These calls may vary in their usage, from hoarse begging (a harsh *kuwätt* or high-pitched *kuwäch*) and a long sequence of grumbling *kwäch* to shrill warnings in sharp staccato (hard *kwäck* or strident *kuwack*). In both owls a shift from begging to alarm or even aggression is observable. Furthermore, Sichuan Wood Owl utters a shrill aggressive *korah* and *guo*, and probably a fierce barking, although I was unable to tape-record the latter. Such notes form the characteristic far-carrying calls uttered at the climax of territorial demarcation in Ural Owl.

Table 3 shows 13 different types of vocalisation known in Ural Owl, in comparison to eight types in Sichuan Wood Owl known to date. Given the striking similarity in their vocal repertoires, there seems little rationale from a vocal standpoint to regard Sichuan Wood Owl as anything other than a subspecies of Ural Owl.

Taxonomic status

Due to their high degree of specialisation as predators, mostly active in darkness, and with dull camouflaging colours, morphological variation is rather limited in many Strigidae. Similarities in size, appearance and feathering should therefore not be used alone to interpret phylogenetic relationships (König 1991). Instead, intraspecific comparisons should rely on as many characters as possible, including vocalisations, which given their function as an isolating mechanism in owls can be considered of great importance. Sichuan Wood Owl differs rather insignificantly from Ural Owl in its vocalisations, and the immediate reaction to an imitation of Ural Owl's territorial song by a male Sichuan Wood Owl—as to a conspecific rival—and to the imitation of nest-site demonstration by a begging female, suggests that even the complete isolation of *davidi* has not led to their separation, at least in vocalisations.

Based on Stresemann's suggestion (1923) that a male Sichuan Wood Owl from 'Hwanglungsze' represented a heavily pigmented form of *uralensis*, this owl has long been considered conspecific with *Strix uralensis*, and in Grossman & Hamlet (1964) was even relegated to merely a 'dark phase' of *S. uralensis*. The Chinese Red Data Book (Zheng Guangmei & Qishan Wang 1998), whilst acknowledging the disjunct populations of *Strix uralensis*, nonetheless treated Ural Owl and Sichuan Wood Owl as conspecific. Both Holt *et al.* (1999) and Dickinson (2003) recognised the need for additional taxonomic studies of *davidi*, with the former electing to treat *uralensis* and *davidi* as members of a superspecies, and Dickinson (2003) as a single species. In contrast, König *et al.* (1999) accept *Strix davidi* as an independent species, pointing to its differing characteristics from the nearest subspecies of Ural Owl, *S. u. fuscescens* in Japan, especially the dark plumage and concentric facial disc pattern, as well as its isolated range, and in this they seem to have been followed by a number of other more recent authorities, e.g. Clements (2003). As to whether *davidi* should be ranked a species seems to depend on which characters are deemed to be most important, although a molecular analysis appears sorely needed.

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A new generic name for the Solitary Cacique

by Rosendo M. Fraga

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The recent reconstruction of a molecular phylogeny of the Icteridae has changed our view of the evolutionary tree of the caciques and oropendolas (Price & Lanyon 2002, 2004). In particular, the caciques, until now entirely classified within the genus *Cacicus*, do not appear to represent a monophyletic grouping. Three separate lineages within this genus have been identified, some more closely related to oropendolas.

The position of Solitary Cacique *Cacicus solitarius* in the phylogenetic tree is entirely isolated from all other caciques, and closer to *Psarocolius* oropendolas. This result has not changed with the incorporation of new data into the molecular phylogeny (Price & Lanyon 2002, 2004), and therefore appears robust. According to Hellmayr (1937), the type species of *Cacicus* Lacépède is Red-rumped Cacique *Oriolus haemorrhous*, described by Linnaeus in 1766. Red-rumped Caciques are outwith the clade containing Solitary Cacique, and thus *Cacicus* is an unsuitable generic name for Solitary Cacique.

Prior to the work of Blake (1968), Solitary Cacique was classified in the genus *Archiplanus* Cabanis 1851. This genus was based on differences in bill shape (Hellmayr 1937). However, the type species of *Archiplanus* is Golden-winged Cacique *Cassicus albirostris* Vieillot 1816, based on Azara's no.59, 'yapú negro y amarillo' (Azara 1802). The current scientific name of Golden-winged Cacique is *Cacicus chrysopterus*. In the phylogenetic tree, this species clusters within the main cacique clade, distant from that containing Solitary Cacique (Price & Lanyon 2002, 2004). The generic name *Archiplanus* could be suitable for species in that clade, but not for Solitary Cacique.

Phylogenetic data indicate that Solitary Cacique cannot be placed in *Cacicus* or *Archiplanus*, and therefore no other generic name for the species appears available (Hellmayr 1937). I propose here a new generic name and combination:

Genus *Procacicus* Fraga, with type species *Cassicus solitarius* Vieillot 1816, type locality Paraguay, based on Azara's no.58, 'yapú negro'. The type locality might be further restricted to Asunción, Paraguay, Azara's residence during most of his life in South America. The new genus is currently monotypic. Etymologically, the proposed name is a simple derivative of the current genus name; the Latin particle 'pro' meaning 'substitute', as in 'proconsul'. The new generic name is masculine, agreeing in gender with the specific name.

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Records of Southern Giant Petrel *Macronectes giganteus solanderi* and Northern Giant Petrel *M. halli* off southern Brazil

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We report records, and comment on the identification, of giant petrels, *Macronectes*, from Rio Grande do Sul (RS), in southernmost Brazil, based on previously unidentified specimens in the seabird collection of the Fundação Universidade Federal do Rio Grande (FURG; see Vooren & Fernandes 1989), Rio Grande, RS, Brazil. All measurements are given in mm and colour names (Capitalised) and codes follow Munsell Color (1971).

Southern Giant Petrel *Macronectes giganteus* breeds at 40–60°S on subantarctic and Antarctic islands, the Antarctic Peninsula and continent, and at several localities off Argentine coasts (Carboneras 1992). On dispersal, it moves north to temperate and even subtropical waters, often following cold currents along the coasts of South America, southern Africa and Australia (Punta & Saravia 1991, Carboneras 1992). The species has long been considered monotypic (e.g. Murphy 1936, Bourne & Warham 1966, Carboneras 1992), but those populations breeding on the Falklands and Gough (South Atlantic), as well as on the Argentine coast, present several distinctive characters compared to birds breeding elsewhere, e.g. generally darker plumage becoming less rapidly paler with age, smaller size and differences in behaviour, being on the whole clearly more gregarious (Voisin 1982). In addition, the green bill tip is more vivid, particularly in the Gough population. Their reproductive schedule is also somewhat peculiar, although this may merely reflect a response to different ecological conditions. Johnstone *et al.* (1976), as well as Peters (1979), thought these birds to be of uncertain taxonomy, but Voisin & Bester (1981) and Voisin (1982) considered them to represent a well-defined subspecies, *Macronectes giganteus solanderi* Mathews, 1912, the South Atlantic Giant Petrel.

M. giganteus is a fairly common winter visitor along the Brazilian coast from RS north to São Paulo and Rio de Janeiro (Sick 1997). Birds of the nominate subspecies ringed in the South Orkneys, South Georgia and the Antarctic Peninsula have been recovered in Brazil, and one from Macquarie (Australian Antarctic Territory) was recovered in Uruguay (Olmos 2002). The subspecies *solanderi* has also been mentioned from the southern Brazilian coast, based solely on morphometrics of specimens taken off RS and Santa Catarina, but without details of these specimens' plumage pattern (Soto *et al.* 2003).

FURG houses a specimen (FURG 12; Fig. 1), referable to *solanderi*, found dead on the beach at São José do Norte (*c.*32°01'S, 52°03'W), southern RS, on 6 June

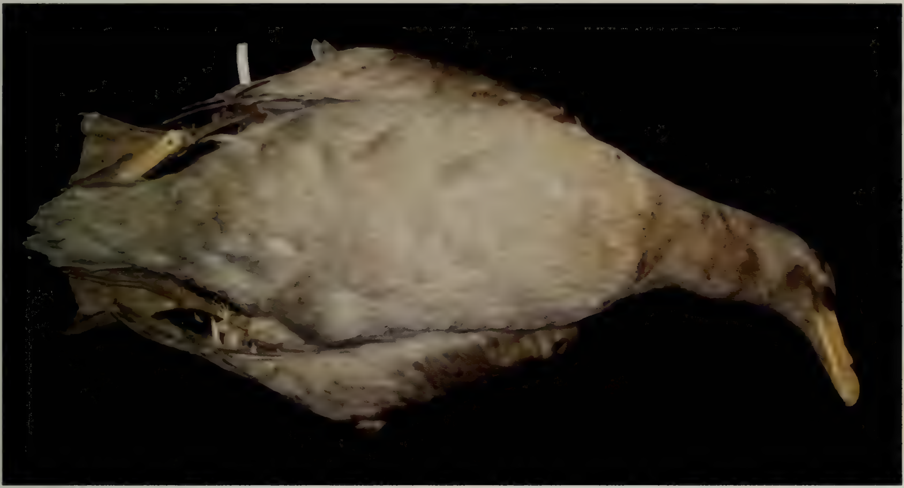

Figure 1. Southern Giant Petrel *Macronectes giganteus solanderi* (FURG 12) from São José do Norte, Rio Grande do Sul, south Brazil (C. E. Fedrizzi)

1983. Its plumage presents the following pattern: head Dark-grey (10YR 4/1) with feathers of forehead, lores and nape tipped Light-grey (10YR 7/1); throat and neck Light-grey with the feather tips Dark-grey; remaining upperparts and uppertail uniform Grey (10YR 6/1); flanks Grey; breast, belly, undertail- and underwing-coverts Grey; under surface of primaries Grey with very Dark-grey (10YR 3/1) tips, and underside of rectrices Grey.

This specimen's plumage places it in type II of Voisin (1982), i.e., entirely brown or grey birds, the area around the base of the bill not distinctly paler (immatures). Birds belonging to *solanderi* have little brown pigment in their plumage, which is thus much greyer than that of the nominate. *M. g. solanderi* commences breeding while still in very dark plumage. In the Falklands, 14% of birds breed when still in type II plumage, an exceptional occurrence in the nominate form. Also, in the Falklands, most birds belong to types IV and V, not types VI to VIII (as in nominate birds from the Crozet archipelago in the south Indian Ocean). Similar observations have been made at Gough and in colonies off the Argentine coast (Voisin & Bester 1981, Voisin 1982, Punta & Saravia 1991; G. Punta pers. comm. 1996). However, it is impossible to know whether the FURG specimen had already bred.

The measurements of the FURG specimen coincide with those of *M. g. solanderi* from the Falklands, Gough and Argentina (Voisin & Bester 1981, Voisin 1982; G. Punta pers. comm. 1996; Table 1). The bird was originally sexed as a female, but the mensural data suggest that it is probably male.

TABLE 1

Measurements (mm) of males and females of *Macronectes giganteus solanderi* from the Falklands and Gough (Voisin & Bester 1981, Voisin 1982), Chubut (Argentina; G. Punta pers. comm. 1996) and of the specimen found on the coast of Rio Grande do Sul (RS; FURG 12), south Brazil. Data are: mean, (± standard deviation; range), and *n* = sample size.

Population		Culmen	Bill depth	Tarsus	Wing
Gough	Males	95.2 (2.3; 91.5–98.5) *n*=17	30 (1.8; 28.5–32) *n*=17	95.3 (2.02; 92–99) *n*=17	507.5 (485–535) *n*=4
	Females	83.3 (2.9; 79–88) *n*=12	27.3 (0.69; 27–28.5) *n*=12	88.3 (3.11; 85–95) *n*=12	478, 491
Falklands	Males	98.9 (2.8; 95–102) *n*=4	30.05 (1.68; 28.5–32.5) *n*=4	93.4 (1.38; 92–95) *n*=4	507.3 (6.18; 500–515) *n*=4
	Females	84.1 (3.05; 80–89) *n*=9	25.9 (1.06; 27.5–24.5) *n*=8	83.1 (2.59; 77–86) *n*=10	484 (9.45; 470–500) *n* =10
Chubut	Males	96.7 (1.5; 95.1–99.3) *n*=6	30.1 (1.0; 29.0–30.8) *n*=3	93.3 (2.9; 89–95) *n*=4	507,2 (10.1; 493–518) *n* =6
	Females	83.3 (2,0; 81.8–88) *n*=8	26.1 (0.2; 25.8–26.5) *n*=6	86.6 (20.2; 83–89) *n*=6	474,1 (12.6; 446–490) *n* =8
RS	Male?	92.3	33.14	91.16	490

Furthermore, a few juvenile *solanderi* metal- and colour-ringed in early 2004 at Patagonian colonies have recently been reported off Rio Grande do Sul (F. Quintana *et al.* unpubl. data *per* F. Rabufetti *in litt.* 2004), suggesting that at least some Argentine South Atlantic Giant Petrels occur regularly along the southern Brazilian coast, where they mix with Antarctic birds.

Northern Giant Petrel *M. halli* breeds on subantarctic islands and South Georgia (at 46–59°S), and disperses widely over the Southern Ocean (Shaughnessy & Voisin 1981, Carboneras 1992). In Brazil, the species is known from only three published records: a juvenile found on 27 September 1994 at Ilha Comprida, São Paulo (*c.*24°50'S, 47°45'W; Martuscelli *et al.* 1995); a female found on 15 October 1999 at 'Praia do Leste', Iguape, São Paulo (24°13'S, 52°40'W); and an adult found on 2 October 2000 near Albardão lighthouse, southern RS (33°13'S, 52°40W) (Bugoni *et al.* 2003).

The FURG has another three adult male specimens from southern RS: FURG 272 (culmen 113.19; bill depth 40.69; tarsus 88.63; wing 530), found near Sarita lighthouse (*c.*32°00'S, 52°10'W) in April 1983; FURG 275 (culmen 106.55; bill depth 41.23; tarsus 97.70; wing 505), from 'Praia do Cassino' (*c*.32°11'S, 52°10'W) on 1 December 1991; and FURG 216 (culmen 100.73; bill depth 42.16; tarsus 92.64; wing 531), without precise locality (between Cassino and Sarita) on 5 October 2000. The plumage of these specimens presents a well-marked contrast between under- and upperparts. *M. halli* is fairly common off Uruguay, and seven ringed birds from Kerguelen, Crozet and Macquarie have been recovered there (Olmos 2002). Most giant petrels from south Brazil have been identified as *M. giganteus*, probably because general references (e.g. Belton 1984) listed only *M. giganteus*, and *M. halli* was first recorded only in the 1990s. Future surveys will probably reveal that *M. halli* is more common in the region than previously supposed.

Closing remarks

At sea, separation of *M. giganteus* and *M. halli* at species level is difficult, unless they are observed in good conditions. The best discriminating criteria are bill colour and plumage pattern (Voisin & Teixeira 1998). *M. g. solanderi* acquires a paler head and neck at an older age and slower compared to the nominate subspecies (Voisin 1982), but the grey tone of its plumage cannot be appreciated at a distance, as is also the case with its smaller size. Also, mensural data alone cannot be used to determine specimens away from their breeding grounds, as there is much overlap (Voisin & Teixeira 1998). Most giant petrels encountered in Brazil are juveniles or immatures (e.g. Sick 1997, Voisin & Teixeira 1998), which can only be identified on the basis of bill coloration. Beached carcasses may be very difficult to determine as, frequently, bill colour has completely faded due to insolation.

Besides the specimens mentioned, FURG houses five more skins, of which one (FURG 274; culmen 98.84; bill depth 38.48; tarsus 89.25; and wing 510) is probably *M. giganteus*. It has a pale head and neck and its underparts are only slightly paler than its upperparts. The remaining three are immatures (i.e. plumage type II of Voisin 1982). Specimen FURG 276 was ringed in the Antarctic Peninsula and is thus a *M. g. giganteus*, whereas the others (FURG 210, 211 and 273) have completely lost their bill-tip coloration, and cannot be specifically determined.

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Naming segregates from the *Columba–Streptopelia* pigeons following DNA studies on phylogeny

by Anthony S. Cheke

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In their pigeon phylogeny reconstructed through mtDNA analysis, Johnson *et al.* (2001) identified, within the monophyletic Old World *Columba/Streptopelia* lineage, four clades: two match the classical taxonomy of Old World *Columba* and most *Streptopelia* (clade A) respectively. The other two, sister to each other, represent in one line (clade C) *chinensis* and *senegalensis*, conventionally placed with little dispute in *Streptopelia*, and in the other (clade B) two species whose generic attribution has recently fluctuated according to different authors: *mayeri* (*Columba*, *Nesoenas*) and *picturata* (*Streptopelia*, *Columba*). Depending on which analysis is performed, clades B and C are sister either to Clade A ('classic' *Streptopelia*) or to Old World *Columba*, i.e. the three-way split was perhaps *c.*7–8 million years ago (based on the molecular clock used by Johnson *et al.* 2001), and could not be adequately resolved by the data. New World *Columba* split off earlier, leading Johnson *et al.* (2001) to re-assign them to a separate genus *Patagioenas* Reichenbach, 1853. K. P. Johnson (*in litt.* 2005) has emphasised that his paper cannot be considered a definitive molecular phylogeny for the *Columba/Streptopelia*, as an important tranche of African *Columba* was not included, namely *delegorguei*, *iriditorques*, *malherbii*, *larvata* and *simplex*. The two last-named species have often been placed in their own genus, *Aplopelia*, which Goodwin (1983) considered close in morphology to *picturata* (Malagasy or Madagascan Turtle Dove), and one might add also in voice (as described by Goodwin 1983 and Sinclair *et al.* 1993 for *larvata*).

In their taxonomic discussion Johnson *et al.* (2001) opted for a conservative interpretation, suggesting simply transferring *mayeri* (Mauritius Pink Pigeon) from *Columba/Nesoenas* to *Streptopelia*. However, given that the age of initial diversification within Old World *Columba* is similar to the split between clades B and C, it might be appropriate to group the four species in B and C within one genus. Alternatively, as the lines diverged rapidly, *mayeri/picturata* could be assigned to one genus and *senegalensis/chinensis* another. A third option, that the entire *Columba/Streptopelia* complex could, as sister to *Patagioenas*, be treated as a single large genus *Columba* with three or four subgenera, is unwieldy and would result in a far greater number of name changes.

The oldest valid name for any of the four species in clades B and C is *Stigmatopelia* Sundevall, created for *senegalensis* in 1872 (Sundevall 1872, Salvadori 1893). Sundevall also created *Spilopelia* for *chinensis* (whose races were at that time treated as three species) on the same page of the same work, but

Stigmatopelia has line precedence. In the two-genus option, *mayeri* and *picturata* would come under *Nesoenas* Salvadori, 1893, which was created for *mayeri* and has page precedence over the same author's *Homopelia* for *picturata* (Salvadori 1893). *Trocaza* Bonaparte, 1854, might be considered the oldest available name on the basis of Shelley's (1883) re-designation of the genus to include only *mayeri*; Shelley pointed out that the type species *Columba trocaz* does not exhibit the diagnostic feature (first primary shorter than fifth), leaving only *mayeri* within the definition. However, the fact remains, Bonaparte's error notwithstanding, that *trocaz* is the type species, making *Trocaza* a junior synonym of *Columba*, and in any case nomenclaturally invalid.

In voice and plumage, as well as mtDNA, *mayeri* and *picturata*, are close (pers. obs.). In addition to mtDNA, Johnson *et al.* (2001) discussed their striking vocal resemblance. *Picturata* has been little studied behaviourally, but McKelvey (1976) reported a mixed pair with *mayeri*, thereby suggesting a close affinity. The uniform dark back, somewhat contrasting rump and tail, and paler head are shared characters (see, e.g., Sinclair & Langrand 1998), albeit much more emphasised in *mayeri*, which is a larger bird, approximately double the mass of *picturata* (Johnson *et al.* 2001). They do not phenotypically resemble Spotted Dove *S. chinensis* or Palm Dove *S. senegalensis*. These two, whilst not particularly similar to each other in appearance, do share a character that differs from other *Columba/Streptopelia* pigeons: distinctly bifurcated feathers in the display plumage on the neck (Salvadori 1893). Goodwin (1983) considered *chinensis* and *senegalensis* to form an isolated pair within *Streptopelia* as defined by him. He commented that, in addition to sharing the bifurcated feathers, they both lacked an 'excitement cry', and their song-calls ('advertising coo'), although dissimilar to each other, are unlike any other *Streptopelia*. Goodwin also noted that *picturata* (not then thought to be related) had 'more or less bifurcated' neck feathers, i.e. a hint of the character fully developed in *S. chinensis* and *S. senegalensis*. He considered *picturata* so anomalous that he did not include it in his putative relationship tree for the genus, and he was also uncertain where to place *mayeri*, including it within *Columba* in the 1967 edition of his work, but restoring *Nesoenas* in 1983, following McKelvey's observations (1976) recording behaviour rather more like *Streptopelia* than *Columba*. Gibbs *et al.* (2001), following Sibley & Monroe (1990), placed *picturata* with *mayeri* in *Columba*.

Here I propose that in order to formally recognise the particularities of these four species, *mayeri* and *picturata* be united in *Nesoenas*, with *chinensis* and *senegalensis* in *Stigmatopelia*. Further studies may well be desirable to further elucidate their relationships, and these would be best conducted in Mauritius, where all four species are now present sympatrically—the two *Nesoenas* native (Mourer-Chauviré *et al.* 1999), the two *Stigmatopelia* introduced, *chinensis* long ago (*c.*1781: Cheke 1987) and *senegalensis* recently (1995: Jones 1996), but now well established (pers. obs. 2003). *Picturata* was long thought to have been introduced to the Mascarenes (Jones 1987, Johnson *et al.* 2001), although Cheke (1987) considered the matter open. However, subfossil material from all three islands now demonstrates it to be native (Mourer-Chauviré *et al.* 1999), albeit perhaps subject to supplementary introduction from Madagascar (Cheke 1987).

As *Stigmatopelia* has not appeared in recent synonymies it may be appropriate to re-cite it, as follows:

Stigmatopelia Sundevall 1872.
Methodi naturalis avium disponendarum tentamen, p.100.
Type by subsequent designation, Salvadori, 1893, Cat. Birds. Brit. Mus., **21**, p. 448.
Columba senegalensis Linnaeus, 1766.
Stigmatopelia senegalensis (Linnaeus, 1766).

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On the apparent status of Mottled Swift *Apus* (*Tachymarptis*) *aequatorialis* and Alpine Swift *A.* (*T.*) *melba* in Mali, West Africa

by R. J. Dowsett & Françoise Dowsett-Lemaire

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Moreau (1972) doubted that Alpine Swift *Apus* (*Tachymarptis*) *melba* breeds in West Africa, but Thiollay (1974) reported thousands during mid June in Mali, between the Plateau Dogon and Hombori (15°10'N, 02°00'W), with signs that they were breeding. This is the only such report for the entire subcontinent. On the other hand, neither Thiollay nor Lamarche (1980) mentioned Mottled Swift *A.* (*T.*) *aequatorialis*, but in reporting some small groups of *A. aequatorialis* in February and June–August at sites in northern Burkina Faso (*c.*14°N, 02°40'W), near the frontier with Mali, Balança & de Visscher (1993) suggested that a breeding area might prove to be the Plateau Dogon in Mali. This was supported by the observations of Spierenburg (2000) from Teli, Bandiagara (*c.*14°21'N, 03°37'W), in October. During a short visit to the Dogon and the Douentza area (15°00'N, 02°57'W) in early March 2002 we did not see a single individual of either species. Intrigued as to the status of *A. melba* as a breeder, and by the possibility of *A. aequatorialis* nesting in Mali, we visited likely areas in 2004, in particular spending three days in mid June around cliffs and large rocky mountains in the Sahel.

MOTTLED SWIFT *Apus aequatorialis*

During more than one month in the Sudanian woodlands of southern Mali in 2004 we saw just one *A. aequatorialis*, near Madina Diassa (10°50'N, 07°44'W), on 23 May (possibly associated with a large rocky hill east of the Baoulé-sud, which was not visited). However, the species was very common (often hundreds together) in the Sahel from Douentza to Hombori, and north and east to the Mare de Gossi (15°48'N, 01°19'W), on 14–19 June. Groups were present around all large cliffs between Douentza and Hombori, and were feeding over or drinking at pools away from cliffs, when they could be observed at very close range. The degree of vocal activity and pairs chasing each other (often around rock faces) was indicative of breeding. Many were examined closely when drinking, and these clearly belonged to a pale race (either *lowei* or *furensis*), with an extensive white throat, trace of a breast-band and greyish-white scalloped belly.

The two forms concerned are *M. a. lowei* (type locality, Mahera, Rokelle River, Sierra Leone), which has an extensive and clearly defined white throat and central belly, separated by a brown band (Bannerman 1920), and the not dissimilar *A. a. furensis* (type locality, El Fasher, Sudan) (Lynes 1920). These races are noticeably different from the dark population '*bamendae*' of Cameroon, which lacks white on the lower breast and belly (Serle 1949). *Lowei* and *furensis* differ in the colour of their upperparts, *furensis* being 'smoky-brown' (Lynes 1920), lacking the contrasting saddle effect of *lowei* (C. H. Fry *in* Fry *et al.* 1988). These are subtle differences, and we cannot say to which race our observations refer—on geographical grounds *lowei* would appear more likely. In Togo Walsh *et al.* (1990) observed up to 50 in February–March: 'the extent of white on belly and throat suggested *A .a. lowei* but *A. a. furensis* cannot be excluded'. In Ghana numbers of *A. aequatorialis* were present in the Accra area with migrant European Swift *A. apus* and *A. melba* ahead of the Harmattan on 4 March, and 'the Mottled Swifts were noticeably paler and the mottling more distinct than the local resident race' (Grimes 1974). As far as we know, no specimens have been examined of the population breeding in southern Ghana, but birds watched very closely in mid May at Tumu in northern Ghana resembled *lowei* (Sutton 1970).

The calls of *A. aequatorialis* encountered in 2004 were a series of 8–10 high-pitched *kikikikiki* notes, delivered more slowly than in *A. melba*, rising then falling. We were able to compare the voices of the two species in eastern Ghana in February 2005, as they were feeding in mixed flocks. The calls are indeed very similar, produced in slightly slower series in *A. aequatorialis*. A recording of these vocalisations of *A. aequatorialis* has not been published; Chappuis (2000) merely re-used the tape of a brief dry call borrowed from Gibbon (1991). Although R. J. Stjernstedt is mentioned by Fry *et al.* (1988) as having taped the species, this is apparently not so (R. J. Stjernstedt *in litt.* 2004).

Breeding populations of *A. aequatorialis* in West Africa are not known with certainty from elsewhere, although the species was stated to be 'nesting' at Mahera in Sierra Leone (Lowe 1921), which is not one of the two better-known places of this name, but clearly Mabala, on the Rokelle River (see Lowe 1932), *c.*08°34'N, 12°47'W. Observed behaviour also suggests nesting at quarries on the Accra Plains, Ghana, 05°54'N, 00°08'W (Grimes 1987) and Wase Rock, Nigeria, 09°04'N, 09°56'E (Dunger 1965).

ALPINE SWIFT *Apus melba*

In contrast, we could find none of the huge numbers of *A. melba* reported as apparently breeding by Thiollay (1974) in the very same localities. With very few exceptions, the numerous reports of *A. melba* that we have traced from West Africa point to the species being no more than a non-breeding migrant from the Palearctic. For example, in Nigeria extreme dates are 7 November–21 May (Elgood *et al.* 1994), in Côte d'Ivoire the species is present October–April (Thiollay 1985) and in Liberia December–April (Gatter 1997). A Swiss-ringed bird was recovered in eastern Ghana on 22 January (Schifferli & Jacquat 1973). We saw several hundred in eastern Ghana in February 2005. The species is also especially numerous in Togo in late January–early March, sometimes in thousands (Walsh *et al.* 1990), to 17 May (Cheke 1982, not 'Cheke 1980' as in Cheke & Walsh 1996). However, there are also reports of a few 'very grey birds' seen in Togo as late as 3 June, and even to 1 July (Cheke & Walsh 1984), which possibly refer to wandering non-breeders.

Discussion

We believe breeding by *A. melba* in West Africa is at most exceptional, the reports of Thiollay (1974) being repeated by no other observer. On the other hand it is clear there is a very substantial, hitherto unreported, breeding population of *A. aequatorialis* in the rocky mountains of central Mali. Breeding elsewhere in the area by *A. aequatorialis* also seems probable, given independent reports from northernmost Burkina Faso by Balança & de Visscher (1993) and B. Portier (*Bull. Afr. Bird Cl.* 2003, 10: 56, and *in litt.*). Taken with our own observations and those of Spierenburg (2000) from Mali, that all these observers have identified large numbers of *A. aequatorialis* where Thiollay (1974) alone reported many *A. melba*, means that the status of the latter species must be considered equivocal.

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A specimen of *Parvicuculus* Harrison & Walker 1977 (Aves: Parvicuculidae) from the early Eocene of France

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The fossil species *Parvicuculus minor* was described by Harrison & Walker (1977) from the early Eocene London Clay deposits in England, and was hitherto known only from an incomplete tarsometatarsus. As indicated by its name, *Parvicuculus* was considered a member of the Cuculidae (cuckoos) by Harrison & Walker (1977).

Cuculiform affinities of *Parvicuculus* were, however, disputed by Olson & Feduccia (1979), who instead assumed the taxon to be a member of the Eocene coraciiform Primobucconidae (Houde & Olson 1989, Mayr *et al.* 2004), in particular they considered a relationship to the alleged primobucconid '*Neanis*' *kistneri* Feduccia 1973 to be possible. Harrison (1982) reevaluated the phylogenetic affinities of *Parvicuculus* and again considered it a member of the Cuculiformes, albeit not within the Cuculidae but in the new taxon Parvicuculidae. Assignment of *Parvicuculus* to the Cuculiformes was subsequently questioned by Martin & Mengel (1984) and Baird & Vickers-Rich (1997); the taxon was placed in Aves *incertae sedis* by Mlíkovský (2002).

Here we report on a second specimen of *Parvicuculus* from the early Eocene of Condé-en-Brie in France. The new specimen is an incomplete tarsometatarsus that exhibits almost the same state of preservation as the holotype of *Parvicuculus minor*. It is the second bird specimen described from Condé-en-Brie, in addition to a tarsometatarsus of the Primobucconidae (Mayr *et al.* 2004). The age of the French locality is the same as that of Burnham-on-Crouch, the type locality of *P. minor* (Mammalian Paleogene 8–9, i.e. *c.*52 million years ago; Mlíkovský 1996, Legendre & Lévêque 1997).

Material and methods

Osteological terminology follows Baumel & Witmer (1993), whilst measurements are in mm and represent the maximum length of the bone along its longitudinal axis. SEM photographs of sections of the French fossil were digitally composed to show the complete bone. The fossil specimens are deposited in the Muséum national d'Histoire Naturelle, Paris, France (MNHN), and the National Museum of Natural History, Washington, USA (USNM).

Systematic paleontology

Parvicuculidae Harrison 1982

Emended diagnosis

Small birds that are characterised by: (1) tarsometatarsus short and stout, (2) with medially situated tuberositas musculi tibialis cranialis, (3) deep fossa infracotylaris dorsalis, (4) well-developed crista medianoplantaris, (5) large foramen vasculare distale, (6) foramen interosseus distalis, and (7) trochlea metatarsi IV with plantarly projecting wing-like flange.

Remarks

Harrison (1982) also included *Procuculus minutus* Harrison & Walker 1977 in the Parvicuculidae and partially based his diagnosis of the latter on this species. However, as already noted by Olson & Feduccia (1979), there is no indication that *P. minutus* is in any way closely related to the Parvicuculidae and we thus present a diagnosis of the taxon based on the type genus *Parvicuculus* alone.

Of the above characters, (1)–(4) are here considered to be derived within Neornithes, as they are absent in presumably basal representatives of this taxon, such as palaeognathous birds and Galloanseres (e.g. Mayr & Clarke 2003).

Parvicuculus Harrison & Walker 1977
Parvicuculus cf. *minor* Harrison & Walker 1977

Referred specimen

MNHN-CB-17345 (left tarsometatarsus lacking the trochlea metatarsi II; Figs. 1A–C, 2A, B).

Locality and horizon

Condé-en-Brie, France (collection Louis); early Eocene, MP 8–9 (Schmidt-Kittler 1987).

Measurements (with dimensions of the holotype *P. minor*, after Harrison & Walker 1977)

Length, 10.5 [11.7]; mediolateral width of trochlea metatarsi III, 1.3 [1.5].

Description and comparison

The short and relatively stout bone is of similar proportions to the tarsometatarsus of the extant Tawny Frogmouth *Podargus strigoides* (Podargidae, Fig. 2D), from which it, however, differs in osteological details. On the proximal end, the eminentia intercondylaris is very low, and the cotylae lateralis et medialis are sloping laterally and medially respectively, thus giving the proximal end a rounded appearance (Fig. 2A), which is further strengthened by the fact that this end is quite damaged and abraded. Two foramina vascularia proximalia are present, situated in a deep fossa infracotylaris dorsalis (Fig. 2A); the lateral foramen vasculare proximale is smaller than the medial one. The tuberositas musculi tibialis cranialis is situated at the medial margin of the bone. There is a well-developed crista medianoplantaris and the fossa parahypotarsalis medialis is more marked than the fossa parahypotarsalis lateralis. The hypotarsus is broken. The foramen vasculare distale on the distal end of the bone is very large, the osseous bridge separating it from the

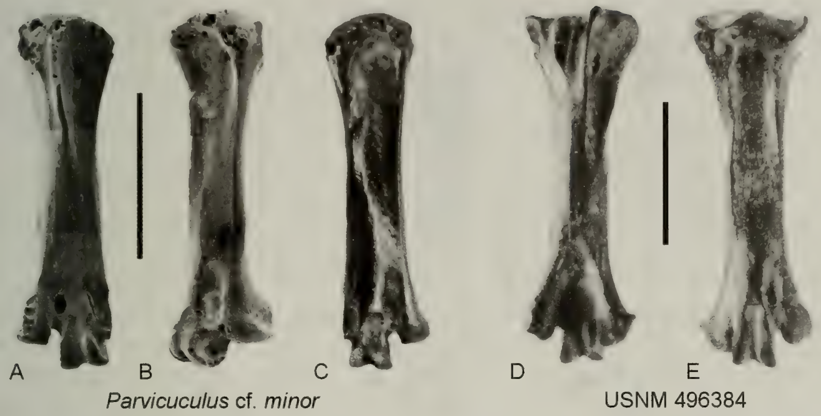

Figure 1. *Parvicuculus* cf. *minor* Harrison & Walker 1977, referred specimen MNHN-CB-17345 from the early Eocene of Condé-en-Brie, France, in plantar (A), dorsolateral (B), and dorsal (C) views, in comparison to the plantar (D) and dorsal (E) aspect of a tarsometatarsus from the early Eocene Nanjemoy Formation, North America (specimen USNM 496384, reversed to facilitate comparisons; from Olson 1999, with permission of the author). A and B are SEM photographs, C is a picture of the sputtered specimen (which originally was white). Scale bars = 5 mm.

incisura intertrochlearis lateralis narrow. Contrary to the Primobucconidae (Mayr *et al.* 2004) and modern rollers *Coracias*, there is a foramen interosseus distalis (Fig. 2B). The fossa metatarsi I is situated at the beginning of the distal third of the bone. The trochlea metatarsi IV is much shorter than the trochlea metatarsi III, somewhat laterally splayed, and bears an elongated, plantarly projecting wing-like flange. The trochlea metatarsi III is approximately as long as it is wide, on the plantar surface the lateral rim reaches slightly farther proximad than the medial one. The trochlea metatarsi II is broken but the remaining parts indicate that it was more plantarly deflected than the trochlea metatarsi IV.

Discussion

Although specimen MNHN-CB-17345 is slightly smaller than the holotype of *Parvicuculus minor*, the size difference may be due to individual variation. We tentatively assign it to *P. minor* Harrison & Walker 1977, as it does not exhibit significant morphological differences from that species.

As noted by Olson & Feduccia (1979) and Baird & Vickers-Rich (1997), the tarsometatarsus of *Parvicuculus* is very different from that of the Musophagidae and Cuculidae. Harrison & Walker (1977) did not list any characters supporting their classification, and Harrison (1982) also failed to present derived characters that support this assignment. The tarsometatarsus of *Parvicuculus* differs from that of the Primobucconidae *sensu stricto* (i.e. the genus *Primobucco*) and all other coraciiform birds in being proportionally more abbreviated and in the plesiomorphic

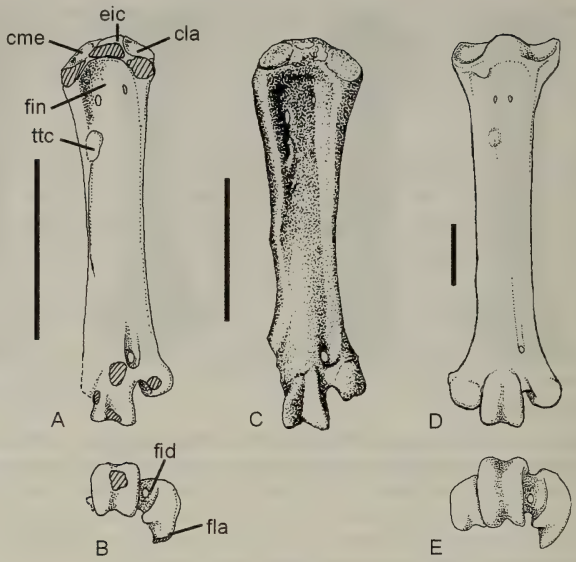

Figure 2. *Parvicuculus* cf. *minor* Harrison & Walker 1977, tarsometatarsus of specimen MNHN-CB-17345 in dorsal (A) and distal (B) views, in comparison to the corresponding bone of (C), the holotype of *Parvicuculus minor* (from Harrison 1982), and (D, E), modern *Podargus strigoides* (Podargidae). Abbreviations: cme—cotyla medialis; cla—cotyla lateralis; eic—eminentia intercondylaris; fid—foramen interosseus distalis; fin—fossa infracotylaris dorsalis; fla—wing-like flange on trochlea metatarsi IV; ttc—tuberositas musculi tibialis cranialis. Scale bars = 5 mm.

(Mayr & Clarke 2003) presence of a foramen interosseus distalis (the canal opening into that foramen is plantarly open in the Primobucconidae: see Mayr *et al.* 2004). '*Neanis*' *kistneri* is known from a flattened skeleton on a slab and its tarsometatarsus cannot be compared in detail with that of *Parvicuculus*. However, '*N.*' *kistneri* clearly had a fully zygodactyl foot, i.e. the fourth toe was permanently retroverted (Feduccia 1973), for which the arrangement of the metatarsal trochleae shows no indication in *Parvicuculus*.

There are several other early Eocene avian taxa with a greatly abbreviated and stout tarsometatarsus bearing a superficial similarity to that of *Parvicuculus*, all of which are, however, clearly distinguished in osteological details. *Parvicuculus* differs from *Pumiliornis tessellatus* Mayr 1999a (Aves *incertae sedis*, Mayr 1999a), *Paraprefica* Mayr 1999b (Nyctibiidae, Mayr 1999b, 2001), and *Palaeopsittacus* Harrison 1982 (Aves *incertae sedis*, Mayr 2003) in the presence of a well-developed crista medianoplantaris and the larger foramen vasculare distale. In addition, the tarsometatarsus of *Parvicuculus* is stouter than that of *Palaeopsittacus* (ratio max. length/min. mediolateral width of shaft is 5.7 mm in *Parvicuculus* vs 6.8 mm in *Palaeopsittacus*), with a deeper furrow of the trochlea metatarsi III, but less stout than that of *Paraprefica* (ratio max. length/min. mediolateral width of shaft is

5.7 mm in *Parvicuculus* vs 4.7 mm in *Paraprefica*). Detailed comparisons with *Fluvioviridavis* Mayr & Daniels 2001 (Aves *incertae sedis*) are impossible, owing to the poor preservation of the tarsometatarsus in the single known specimen of the latter taxon (see Mayr & Daniels 2001).

The tarsometatarsus of *Parvicuculus* closely resembles, however, a complete tarsometatarsus from the early Eocene of the North American Nanjemoy Formation (specimen USNM 496384), that was assigned to the apodiform Aegialornithidae by Olson (1999), but has not been compared with *Parvicuculus*. Differences from *Parvicuculus* mainly concern the proportions of the bone, which is slightly stouter in *Parvicuculus*, and the size of the foramen vasculare distale, which is larger in *Parvicuculus* (Figs. 1D, E). As noted by Olson (1999), the Nanjemoy tarsometatarsus is more abbreviated than the corresponding bone of the Aegialornithidae (see Mourer-Chauviré 1988: pl. 1), and we consider it likely that it belongs to a member of the Parvicuculidae. It further differs from the tarsometatarsus of the Aegialornithidae in that there are plantarly open furrows on the hypotarsus, instead of a closed canal. Additional skeletal elements are required for a definitive phylogenetic placement of the Parvicuculidae, although tarsometatarsal morphology of this taxon does not conflict with a position within or close to the Cypselomorphae *sensu* Mayr (2002), i.e. a clade including Caprimulgidae (nightjars), Nyctibiidae (potoos) and apodiform birds (swifts and hummingbirds). As exemplified by the complete Nanjemoy specimen, the Parvicuculidae agree with modern Steatornithidae (oilbird) in the shape of the trochlea metatarsi III and the presence of a plantarly open furrow on the hypotarsus. The Oilbird *Steatornis caripensis* also has a greatly abbreviated tarsometatarsus which otherwise, however, strongly differs from that of *Parvicuculus* in many osteological details, including absence of a crista medianoplantaris and the arrangement of the trochleae (Mayr 1999b: fig. 11).

Independent of its precise phylogenetic affinities, the specimen described in this study is of interest, as it is not only one of the very few avian records from the early Eocene of France, but also provides evidence for the existence of a previously unrecognised distinctive group of birds that appears to have been widespread in the early Eocene of the Northern Hemisphere.

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Cisticola dorsti (Dorst's Cisticola) and *C. ruficeps guinea* are conspecific

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The specific distinction of Dorst's Cisticola *Cisticola dorsti* was well demonstrated by its describers, Chappuis & Erard (1991), from three specimens collected in Cameroon and Chad, two of which had been tape-recorded (Chappuis 1974, under the name *C. mongalla*). Dorst's Cisticola was shown to be distinguishable vocally and morphologically from the parapatric Red-pate Cisticola *C. r. ruficeps*, with which it had been confused in the past. The distinctive song of Dorst's Cisticola was also tape-recorded in north-western Nigeria around Gusau (Chappuis & Erard 1991) (a gazetteer of localities is given below). The authors did not, however, examine in detail the relationship of Dorst's to the Upper Guinea *C. r. guinea*, something we have been able to do, in both field and museum. In particular the voice of *C. r. guinea* was undescribed until recently. Chappuis (*in* Chappuis & Erard 1991) had not heard the typical whistled song of *C. r. ruficeps* west of Maiduguri nor the dry trills of *C. dorsti* west of Gusau (both loci in Nigeria). In recent years, however, several observers have identified Dorst's Cisticola on the basis of its distinctive voice: in The Gambia (locally common in savanna woodland: Barlow *et al.* 1997), in northern Côte d'Ivoire (e.g. Rheindt *et al.* 2002), in south-west Mali and northern Ghana (FDL & RJD, see below) where it is also locally common.

This prompted one of us (NB) to re-examine the long series of *C. r. ruficeps* and *C. r. guinea* in the Natural History Museum (Tring), including topotypical material of *guinea* from Ghana (type locality Kintampo, Ashanti). Our conclusions are that *C.* (*r.*) *guinea* is synonymous with *C. dorsti*, and is the earlier name. The distribution of *C. r. ruficeps* is centred on Sudan, extending east to Eritrea and west to north-east Nigeria, northern Cameroon and southern Chad. This paper does not deal with the other two races included in *C. ruficeps* (*mongalla* and *scotoptera*) which are from areas to the east and south-east (Lynes 1930) and probably all referable to *C. ruficeps sensu stricto.*

The taxa concerned

Cisticola ruficeps ruficeps (Cretzschmar 1830), in Rüppell, W. P. E. S. 1826–30. *Atlas zu der Reise im nordlichen Afrika*: 54: pl. 36. Type locality: Kordofan, Sudan.

Cisticola* (*ruficeps*) *guinea Lynes 1930, *Ibis* (12) 6 (Suppl.): 542. Type locality: Kintampo, Ashanti, Ghana.

Cisticola dorsti Chappuis & Erard 1991, *Bull. Brit. Orn. Cl.* 111: 60 (see also p.70). Type locality: near Mokolo, Cameroon.

Field investigations

We came across *C. r. ruficeps* in northern Cameroon: the species is common in low thorn scrub of the Sahel zone between Maroua, Mora and Waza. Several birds observed in the dry season on 20 March 1997 (FDL & RJD) were in non-breeding dress (with heavily streaked back) but already in full song.

In March 1999 FDL & RJD spent a month in Bénoué and Faro National Parks (NP), south of Garoua, and saw many Dorst's Cisticolas at several localities: at Buffle Noir, Sakjé, Grand Capitaine (Bénoué NP), Camp des Hippos and the Faro/Déo confluence (Faro NP). Birds had a rufous cap, a pale eyebrow, a brown-grey, mostly plain back, reddish wings and buffy flanks. They were often associated with the larger Singing Cisticola *C. cantans* and smaller Short-winged Cisticola *C. brachypterus*. There was little singing before 13 March when an unusually heavy and early storm provoked a burst of vocal activity in all cisticolas throughout the area for some ten days. The dry metallic trills characteristic of Dorst's Cisticola were heard almost daily on 14–24 March and were tape-recorded at Sakjé on the 14th. Playback of Chappuis's tapes of Dorst's Cisticola (*in* Chappuis 1974) provoked strong reactions in the bird tape-recorded. The birds were usually found feeding in dry grass, often unburnt patches, in the understorey of open scrubby or low-canopy woodland dominated by medium-sized trees such as *Burkea africana*, *Faurea speciosa*, *Lophira lanceolata* and *Protea madiensis*.

In February 2002 FDL & RJD encountered several Dorst's Cisticolas in south-west Mali (in the Monts Mandingues at Tambalé and Tombané, in the Haut Bafing at Soukoutali and at the Bafing–Balé confluence, in the Baoulé Sud area near Ntjila and near Madina Diassa) as well as just inside Guinea on the Balé. The habitat was similar to that in Cameroon, i.e. grassy understorey of fairly open Sudanian woodland. These birds were again often associated with *C. cantans* (the commonest cisticola in the area), less frequently with *C. brachypterus* or Rufous Cisticola *C.*

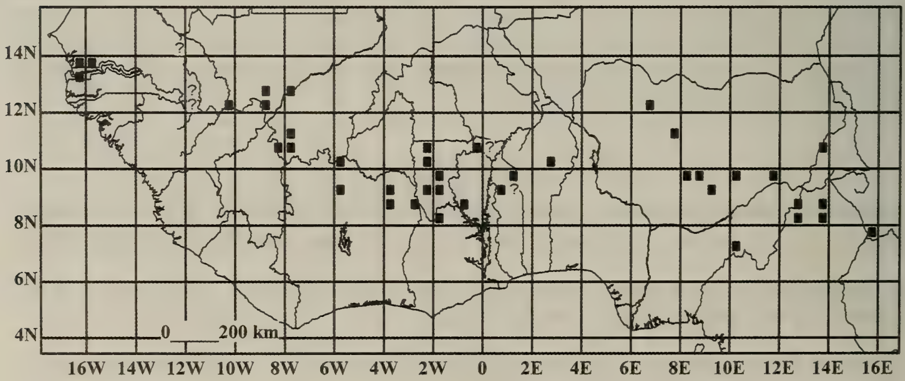

Figure 1. Distribution of confirmed records of *Cisticola guinea* in West Africa, with some (?) that require confirmation.

rufus. We identified them from their plumage (similar to that of Dorst's Cisticola in Cameroon, i.e. rufous cap, pale eyebrow, brown-grey back, reddish wings, warm buffy flanks), and voice. Although they were not singing spontaneously (February being 2–3 months before the start of the rains), one bird was brought into song through playback of the Chappuis tape, and gave an identical dry metallic trill. One bird mist-netted and photographed at Soukoutali on 11 February was in fresh plumage (wing 47.5 mm, tail 50 mm) with a slightly mottled back—a feature not obvious in field conditions where the back appears virtually plain.

On a second visit to south-west Mali, in May–June 2004, FDL & RJD encountered the species only once, but did not revisit the Haut Bafing nor the Mandingue Plateau. They found a singing bird in a patch of open woodland south of Kalana, on 25 May. The fresh grass was still short in the early rains, but the bird was right next to a pair of Red-winged Warblers *Heliolais erythropterus*—indicative of high rank grass in full summer.

Further investigations in northern Ghana, in and around Mole NP, were undertaken by the same observers at the peak of the rains, in August–September 2004. At that season all cisticolas were vocally very active and difficult to overlook. Dorst's was found at nearly all visited sites and could be qualified as locally common, occurring in patches of suitable habitat with several pairs in relatively close proximity. It was found at several places between Mole park headquarters and Brugbani camp, east of Brugbani camp (towards Haraba-Haraba pool), along the southern boundary road, near Mognori in the south-east and near Ducie in the west. In the majority, the habitat was short, open woodland on water-logged clay, and grass cover (mostly *Andropogon* sp.) was 1–2 m tall. In such wet places Dorst's frequently associated with Croaking Cisticola *C. natalensis* and *C. brachypterus*, and *Heliolais erythropterus* and Moustached Warbler *Melocichla mentalis*. The other characteristic habitat was short woodland on sand, with a subshrub cover (Tiliaceae, a *Triumfetta*) (e.g. east of Brugbani camp); in this dry woodland the common cisticola congenerics were *C. cantans* and *C. rufus*, and Brown-rumped Bunting *Emberiza affinis* was also particularly conspicuous. Extensive tape-recordings were made on 10 August near Ducie, including the usual song-type (somewhat metallic or more liquid trills), the 'combat' song *pîe, pli-u pli-u pli-u pli-u* in reaction to playback, the high-pitched, slightly descending whistles *pseee, pseee, pseee* often given in series (all in Chappuis 1974, 2000), and a series of dry *kif-kif-kif* calls, occasionally associated with 'combat' songs. On a subsequent visit to northern Ghana in February–March 2005 we also found Dorst's Cisticola in Gbele Resource Reserve and Bui National Park. This being the dry season, the birds were rather silent, and the first song was heard on 23 March.

Present-day distribution of Dorst's Cisticola

Based mostly on vocal evidence the presence of Dorst's Cisticola is now well established in the Sudanian (=Guinea) savanna belt from The Gambia to northern

Cameroon and adjacent southern Chad (Fig. 1). The presence of *C. ruficeps* has been claimed from as far west as Senegambia (Morel & Morel 1990) but there is as yet no vocal evidence that *C. ruficeps sensu* Chappuis & Erard (1991) occurs in the Sahel belt west of north-east Nigeria. Bates (1930) remarked that he had not found it west of northern Nigeria, and during his subsequent expedition through the Sahel of Niger, Mali and Burkina Faso, in 1931–32 (Bates 1933–34), he found nothing that could have been attributed to *C. ruficeps*. Other West African reports, which may or do refer to *C. dorsti*, and none of which can be accepted as *C. ruficeps*, are mentioned below in a review of the known distribution of Dorst's Cisticola.

Benin: *C. ruficeps* was recorded by Holyoak & Seddon (1990) from an unnamed locality at 10°25'N, 02°44'E (i.e. Gamia).

[*Burkina Faso*: Dowsett (1993) listed it on the basis of a still unpublished and undocumented record from Y. Thonnérieux (in MS), which cannot now be accepted.]

Cameroon: *C. ruficeps* is confirmed to occur in the Sahel south to Garoua (Chappuis & Erard 1991). *C. dorsti* ranges south from Mokolo (the type locality) to Benoué NP (Buffle Noir, pers. obs.).

Chad: *C. ruficeps* is known from the Ndjamena area, south even to Moundou, and *C. dorsti* further south still at Bekao and Baibokoum (Chappuis & Erard 1991).

Ghana: In addition to the type specimen of *guinea* (from Kintampo), there are others from localities north to 10°34'N (Gambaga). Records attributed to *C. ruficeps* from Mole NP (Grimes 1987) were confirmed as Dorst's by FDL & RJD in 2004. Mole is just 125 km north of Kintampo; the suitable woodland habitat starts just north of Kintampo town, and in 2005 the species was also found in Gbele Resource Reserve and Bui National Park (FDL & RJD pers. obs.).

Guinea: Found on the Guinea side of the border at the Bafing–Balé confluence in February 2002 (FDL & RJD pers. obs.).

Côte d'Ivoire: It is known that *C. dorsti* is present in Comoé (Rheindt *et al*. 2002) and Korhogo (unpublished tape-recording recently rediscovered by C. Chappuis *in litt*.). Thiollay (1985) wrote of *C. ruficeps*: 'Several mistnetted from Korhogo to M'Bingue. Cited from Comoé' (i.e. between *c*.09°22' and 10°N). Doubtless all references to *ruficeps* are in fact *dorsti*.

Mali: *C. dorsti* is known from a limited area of the south-west, from the Haut Bafing and Mandingue Plateau to the Ouassoulou Balé plain (see above). *C. ruficeps* is listed for the Koulikoro area by Robertson (2001: Important Bird Area 16), but we have no details. FDL & RJD searched for *C. ruficeps* well into the Sahel, north and east as far as Gao, but did not find any. Lamarche (1981) had reported *C. ruficeps* as widespread south of 16°30'N (and also gave Tamesna as a locality, 18°25'N); the specimens he mentioned as having collected were deposited at the Ecole Normale

Supérieure, Bamako (B. Lamarche *in litt.* 2002), but staff of that institution are quite unaware of any specimens at all having been left there (L. Granjon pers. comm. 2002). Duhart & Descamps (1963) reported a *C. ruficeps* collected at Kara (14°10'N), but no specimen that could possibly be this species is held in the collection of *Cisticola* spp. in the Paris museum (E. Pasquet *in litt.* 2003).

Niger: Giraudoux *et al.* (1988) reported observations of *C. ruficeps* at Dosso (13°03'N) and K. D. Christensen (*in litt.* 2004) saw one that he thought was this species between Diffa and Nguigmi (*c.*13°30'N, 12°45'E). Further investigation (including tape-recordings) is needed to confirm these identifications, which may relate to *C. ruficeps*.

Nigeria: Although Elgood *et al.* (1994) recognised *C. dorsti*, their treatment of *C. ruficeps* 'from Sokoto to Maiduguri and south to Zaria, ... Kafanchan and the Jos Plateau' must surely include some records of *C. dorsti*. These authors have certainly misinterpreted Chappuis & Erard (1991), who reported *C. ruficeps* only from Maiduguri (not *C. dorsti*), and not south to the Jos Plateau (the other localities under *C. ruficeps* relating to *C. dorsti*). They also overlooked a specimen record of *guinea* even further south, at Takum (Lynes 1930). The record from Kafanchan is of nests with eggs found by Serle (1940) and attributed by him to *C. r. guinea*. Most Nigerian records are thus probably referable to *C. dorsti*. There is vocal evidence in support of this, not only from Gusau (Chappuis & Erard 1991) but also between Kaduna and Jos—the song of *C. dorsti* can be heard in the background of the recording of *C. rufus* published by Chappuis (2000). *C. ruficeps* is possibly at Sokoto, where reported by Mundy & Cook (1972); singing birds were apparently tape-recorded, but we have not been able to trace the recording.

Senegal and The Gambia: Barlow *et al.* (1997) have shown that *C. dorsti* is present in Kiang West National Park (The Gambia), from where there are tape-recordings confirmed by C. Chappuis (*in litt.*). Lynes (1930) identified specimens from localities in The Gambia as *guinea* (confirmed by NB from material in Tring). There are records attributed to *C. ruficeps* from Senegal between 12°29'N (Kédougou) and 14°27'N (Kidira, in the Falémé) (Morel & Morel 1990) which may well prove to be *C. dorsti* too.

[*Sierra Leone*: Dowsett (1993) listed *C. ruficeps* on the basis of a misreading of Bannerman (1921), '*C. rufopileata*' being *C. anonymus*. We know of no record that could be either this species or *C. dorsti*.]

Togo: Specimens from Togo were ascribed to *Cisticola ruficeps* (Binaparba and Niamtougou), based on the publications of De Roo *et al.* (1969, 1971), and several other localities mentioned, north to Tantigou (10°51'N) (Cheke & Walsh 1996). M. Louette and R. Demey (M. Louette *in litt.* 2003) have confirmed that the skin from Binaparba is *C. dorsti*, that two alcohol specimens from that locality look similar and the Niamtougou specimen in alcohol is probably *dorsti* too.

Specimens of *C. r. ruficeps* and *C. r. guinea*

The collection at Tring holds 45 *C. r. ruficeps*: five juveniles (from Sudan), 31 non-breeders (26 from Sudan, four from Cameroon [Maroua/Mora], one from Nigeria) and nine breeders (eight from Sudan, one from Nigeria in such bad condition that its identity is open to question). There are also 40 *C. r. guinea*: four juveniles (from Ghana), 11 non-breeders (four each from The Gambia and Ghana, and three from Nigeria) and 24 breeders (one from The Gambia, 15 from Ghana, three from Nigeria and five from Chad: these last having been considered intermediate by Lynes 1930). In breeding dress the crown colour of *C. r. guinea* tends to be somewhat duller and darker than the red crown of *C. r. ruficeps* and shows a less clear-cut division with the mantle (which is browner); the vent and underparts appear buff rather than white. In most, the black-and-white pattern on the undertail-feathers exhibits less contrast than in *C. r. ruficeps*. These are all features of *C. dorsti sensu* Chappuis & Erard (1991), which were well seen in the field by us in Cameroon and Mali, in birds singing like Dorst's. Non-breeding dress is somewhat streaked but nowhere near that of non-breeding *ruficeps*, a difference that was also striking to Lynes (1930). On the basis of log-transformed data of tail, wing, bill and tarsus measurements, Chappuis & Erard (1991) kept *C. r. guinea* within the *ruficeps* concept and apart from their three *dorsti* specimens, but one of their *dorsti* birds virtually overlaps with a specimen of *C. ruficeps guinea* (their Fig. 2); the small sample of *dorsti* also makes the value of these measurements questionable.

Habitat and biomes of Dorst's Cisticola and *C. r. ruficeps*

All accounts of Dorst's Cisticola habitat refer to grassy understorey in open or scrubby Sudanian woodland (dry or seasonally wet), including secondary situations such as dense secondary shrub growth in cut-through savanna woodland (as in Barlow *et al.* 1997). The distribution of Dorst's Cisticola from Senegambia to Chad fits that of a 'Sudan-Guinea Savanna biome' species as defined by Fishpool & Evans (2001), this biome corresponding to the Sudanian region or phytochorion of White (1983).

In contrast, *C. ruficeps* appears restricted to grassy thorn scrub in the Sahel, the drier vegetation belt to the north of the Sudanian region (White 1983). *C. ruficeps* and Dorst's come closest to each other in northern Cameroon, with the former in the Sahel plain around Mora, and Dorst's in the adjacent Mandara (or Kapsiki) Mts to the west. The type locality of Dorst's ('near Mokolo') is said to be at an altitude higher than the Sahel plain (Chappuis & Erard 1991) and bears low or open Sudanian broadleaf woodland; Chappuis & Erard give no precise altitudes but Mokolo town is at 850 m whereas the Mora-Waza plain is *c.*300–350 m. Dorst's Cisticola is most common in the Bénoué plain to the south, which is dominated by Sudanian woodland and from which *C. ruficeps* appears absent (pers. obs.). Further east, as in Sudan, *C. ruficeps* occurs in the Sahel zone, where 'the hard and thorny type of vegetation is dominant' (Lynes 1930). Thus these two cisticolas are well segregated ecologically and biogeographically.

Winter plumage of Dorst's Cisticola and its relatives

The winter dress of Dorst's Cisticola was not described by Chappuis & Erard (1991), as their three specimens were collected in the rainy season, in the months of June and August. The winter dress of *C. r. ruficeps* and Dorst's Cisticola observed in the same month, March, in northern Cameroon appears remarkably different, the former being heavily streaked on the back whereas the latter appears to have a plain back or only slightly mottled. Birds in southern Mali and northern Ghana also showed a plain back, although in the one bird handled in Mali it appeared to be slightly mottled. Similarly Lynes (1930) noted, concerning West African *C. r. guinea*, 'not very different to *ruficeps* in the summer, but rather markedly different in the winter dress', the streaking on the back being 'softer, of smaller colour contrasts'.

Conclusions

On the basis of coloration of breeding and non-breeding birds, in particular the distinctiveness of the winter dress of Dorst's Cisticolas seen in the field and of *C. ruficeps guinea* observed in the museum, on the vocal evidence showing Dorst's Cisticola to be widespread in West-Central Africa from The Gambia to Chad, and on the remarkable concordance of the 'vocal distribution' of Dorst's Cisticola with that of the specimen distribution of *C. ruficeps guinea*, we conclude that Dorst's Cisticola *C. dorsti* is a synonym of and is antedated by *C.* (*ruficeps*) *guinea*. 'Dans le cas présent, on peut considérer que *dorsti* est synonyme de *guinea*' (C. Erard *in litt.* 2004). *C. guinea* and *C. r. ruficeps* are no more than parapatric (in northern Cameroon, possibly in northern Nigeria), occupy different habitats and biomes, the former being Sudanian and the latter Sahelian. We recommend retaining the English name Dorst's Cisticola for what must now become *Cisticola guinea*.

Gazetteer of cited localities

Bafing–Balé confluence, Mali	12°14'N, 10°20'W
Baibokoum, Chad	07°46'N, 15°43'E
Baoulé River, near Madina Diassa, Mali	10°48'N, 07°40'W
Baoulé River, near Ntjila, Mali	11°17'N, 07°34'W
Bekao, Chad	07°51'N, 15°58'E
Binaparba, Togo	09°14'N, 00°46'E
Buffle Noir, Benoué NP, Cameroon	08°06'N, 13°50'E
Bui NP (Ntereso), Ghana	08°47'N, 02°35'W
Campement des Hippos, Faro NP, Cameroon	08°23'N, 12°49'E
Comoé NP, Côte d'Ivoire	09°25'N, 03°50'W
Diffa, Niger	13°19'N, 12°37'E
Dosso, Niger	13°03'N, 03°12'E

Ducie, Mole NP, Ghana	09°47’N, 01°57’W
Faro/Déo confluence, Faro NP, Cameroon	08°30’N, 12°43’E
Gambaga, Ghana	10°31’N, 00°22’W
Gamia, Benin	10°25’N, 02°44’E
Gao, Mali	16°16’N, 00°03’W
Garoua, Cameroon	09°18’N, 13°24’E
Gbele Reserve (Wahabu), Ghana	10°24’N, 02°04’W
Grand Captaine, Benoué NP, Cameroon	08°34’N, 13°57’E
Gusau, Nigeria	12°12’N, 06°40’E
Jos Plateau, Nigeria	*c.*09°54’N, 08°53’E
Kaduna, Nigeria	10°32’N, 07°24’E
Kafanchan, Nigeria	09°37’N, 08°18’E
Kalana, Ouassoulou Balé, Mali	10°47’N, 08°12’W
Kara, Mali	14°10’N, 05°01’W
Kédougou, Senegal	12°29’N, 11°57’W
Kiang West NP, The Gambia	13°20’N, 16°00’W
Kidira, Falémé, Senegal	14°27’N, 12°12’W
Kintampo, Ashanti, Ghana	08°04’N, 01°44’W
Kordofan, Sudan	*c.*13°20’N, 30°20’E
Korhogo, Côte d’Ivoire	09°22’N, 05°31’W
Koulikoro, Mali	12°52’N, 07°33’W
Maiduguri, Nigeria	11°50’N, 13°09’E
Mandara (Kapsiki) Mts, Cameroon	*c.*10°30’N, 13°30’E
Maroua, Cameroon	10°36’N, 14°20’E
Mbingué, Côte d’Ivoire	10°00’N, 05°54’W
Mokolo, Cameroon	10°45’N, 13°48’E
Mole NP, Ghana	09°16’–09°22’N, 01°51’–01°57’W
Mora, Cameroon	11°03’N, 14°09’E
Moundou, Chad	08°35’N, 16°01’E
Ndjamena, Chad	12°07’N, 15°02’E
Nguigmi, Niger	14°15’N, 13°07’E
Niamtougou, Togo	09°46’N, 01°06’E
Sakjé, Benoué NP, Cameroon	08°10’N, 13°38’E
Sokoto, Nigeria	13°02’N, 05°13’E
Soukoutali, Bafing River, Mali	12°29’N, 10°17’W
Takum, Nigeria	07°13’N, 10°00’E
Tambalé, Monts Mandingues, Mali	12°33’N, 08°53’W
Tamesna, Mali	18°25’N, 03°33’W
Tantigou, Togo	10°51’N, 00°12’E
Tombané, Monts Mandingues, Mali	12°16’N, 08°46’W
Waza NP, Cameroon	*c.*11°25’N, 14°40’E
Zaria, Nigeria	11°03’N, 07°42’E

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A range extension for Dusky-tailed Flatbill *Ramphotrigon fuscicauda* in eastern Amazonia

by Marcelo Ferreira de Vasconcelos

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Dusky-tailed Flatbill *Ramphotrigon fuscicauda* is a rare and poorly known Amazonian flycatcher (Parker 1984, Ridgely & Tudor 1994). Until recently, it was believed to be restricted to western Amazonia and adjacent Andean foothills (Parker 1984), but subsequent records extended its range eastward (Parker *et al.* 1997, Zimmer *et al.* 1997, Whittaker & Oren 1999, Aleixo *et al.* 2000).

In Brazil, there are only six known localities: Alta Floresta (09°41'S, 55°54'W), in northern Mato Grosso; Carajás (06°00'S, 51°20'W), Pará; Alegria (08°57'S, 72°25'W), Acre; Quieto (09°00'S, 72°49'W), Acre; Pinkaiti (07°46'S, 51°58'W), Pará; and Catuaba (10°04'S, 67°37'W), Acre (Parker *et al.* 1997, Zimmer *et al.* 1997, Whittaker & Oren 1999, Aleixo *et al.* 2000, Guilherme *et al.* 2003). Here, I report a range extension for this species in eastern Amazonia.

On 6 August 2004, I heard a typical whistled call of a *Ramphotrigon* flycatcher in an upland forest (*terra firme*) fragment in Marabá municipality (05°39'S, 49°28'W), south-east Pará, Brazil. The bird was in a forest edge, close to a dirt road, with many vines and tangles in the mid-storey. Bamboos were rare, with just scattered individuals of *Olyra* sp. in the understorey. I tape-recorded the bird and in response to playback it approached several times, being observed for *c.*20 minutes, enabling me to confirm identification as Dusky-tailed Flatbill. The bird perched on thin horizontal branches or vines, generally 3–4 m above ground. Following playback, the individual vocalised a variant of the whistled call more frequently and, after some minutes, gave a whistled song similar to that described by Guilherme *et al.* (2003). No agitated behaviour, including wing or tail movements was noted. The vocalisations were very similar to those presented by others (Parker 1984, Schulenberg *et al.* 2000, Guilherme *et al.* 2003). Copies of vocalisations have been deposited at the Arquivo Sonoro Prof. Elias Coelho (ASEC), Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

This is the easternmost record for Dusky-tailed Flatbill, the closest locality being Carajás, *c.*200 km to the west (Paynter & Traylor 1991, Whittaker & Oren 1999). My record also emphasises that this flatbill is not restricted to bamboo-rich understorey, but also occurs in vine-rich areas (without bamboo) in both the understorey of *terra firme* forest and in vine-rich floodplain forests without bamboo (Parker 1984, Terborgh *et al.* 1984, Whittaker & Oren 1999.). Given that the species has been found from western Amazonia to the left bank of the rio Tocantins, it is probable that it will be recorded elsewhere in Amazonian Brazil in suitable habitat (see Aleixo *et al.* 2000).

Acknowledgements

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The eggs of *Corvus tristis* and *Corvus moneduloides*

by Michael Walters

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Corvus tristis

Goodwin (1976, 1986) described two eggs of this species, the only two he had seen, and his comments were evidently followed in good faith by Madge & Burn (1994) as a valid description of the species' eggs. The eggs in question are in The Natural History Museum (NHM, Tring), but their provenance is highly suspect. They were purchased at Stevens' Sale Rooms, in 1862, where they had been identified as being of *Manucodia atra* (=*M. nigra*; Paradisaeidae), and were stated to have been taken in Mysol (=Misool) in the western Papuan chain. They were registered

1862.12.17.1, but are clearly not eggs of a *Manucodia*, rather a *Corvus*, albeit rather atypical being pale greenish white, heavily spotted at the broad end and sparingly elsewhere with brown. Realising that they were incorrectly identified, Ogilvie-Grant (1912) reidentified them as *Corvus fuscicapillus*, but noted their doubtful identity, calling them 'Two eggs believed to be those of the Great-billed Crow'. In the 1960s, Shane Parker when curating the NHM collection apparently altered the identification to *Corvus tristis*, for unknown and unsubstantiated reasons. Neither species of *Corvus* is known from Misool (Madge & Burn 1994). The identity is therefore unproven and there is no valid description of the eggs of *C. tristis*.

Corvus moneduloides

Goodwin (1976) stated that this species 'usually' lays two eggs per clutch, presumably because Shane Parker wrongly catalogued two eggs in NHM as a clutch. He evidently overlooked that the catalogue of H. B. Tristram (in whose collection they originally were) clearly states 'From a nest of 4 eggs taken by E. L. Layard … The first nest known. The other two eggs [are] in Herr Nehrkorn's collection'. Goodwin (1986) modified this information to 'usually 2 or 3 eggs per clutch'. His source is unclear, but these data were also transcribed in good faith by Madge & Burn (1994). Thus, whilst there is no reason to doubt the identity of what are probably the only known eggs of the species, the published information on clutch size appears incorrect.

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The correct authorship of the name *Astur kienerii* (Rufous-bellied Hawk Eagle)

by Edward C. Dickinson

Received 12 February 2005

For almost 40 years credit for naming this species, now usually placed in the genus *Hieraaetus*, was accorded in publications on Indian birds to 'de Sparre, 1835' (Blyth 1852, Horsfield & Moore 1854, Hume 1869, 1873), but Sharpe (1874) credited the name to Geoffroy St Hil[aire] in '*Rev. Zool.*, 1845, pl. 35 (1835)'. Since then some writers have followed the earlier authors and others Sharpe.

In Horsfield & Moore (1854) the name is credited to de Sparre, but confusingly their first listed citation referred, using the name *Spizaetus Kienerii*, to '*Mag. de Zool.* (1835) Ois. t. 35. Gervais'! This is the correct journal and plate, but reference to the original text page for Plate 35 only identifies the author as 'G.S.', and this is also what is found in the Table Méthodique for the year 1835, i.e. the index to the volume. The plate is also initialled similarly, although labelled *Falco Kienerii*. The generic name *Spizaetus* was not associated with the species here. So, there is nothing therein to firmly identify G. S. with either de Sparre, or Gervais, whose initials were F. L. P. However, the first page of the Table Méthodique (Fig. 1) is instructive. 'G.S.' appears twice and Gervais is listed as the author of four other species (depicted in Plates 41–44). Despite the different attributions, Gervais was cited as the author by Lesson (1843), Kaup (1848) and Schlegel (1862), as well as elsewhere.

In part, Sharpe's citation seems no more than a simple error, mistaking *Rev. Zool.* for *Mag. de Zool.* Presumably Sharpe did not see the Table Méthodique and deduced the authorship logically from the initials, although it is possible that Sharpe was not the first to do so. However, reference to the same page in the Table Méthodique, page iv, for the year 1835, shows that *Melogale fusca* (Plate 16 in Classe 1: Mammifères) is credited to 'Is[adore] Geoffroy' and *Hyena fusca* (Plate 17 in Classe 1: Mammifères) to 'Geoffroy St-H.'. These two usages may be a well-understood way to distinguish the young Isadore from his well-known father Etienne, but a third abbreviated form is used on page v, 'Geoff. St.H.', which is probably Etienne again. Whichever of this distinguished family of French naturalists could have been involved, it seems most unlikely that 'G.S.' would have been used for one of them, and one may reasonably conclude that Sharpe erred in his attribution.

Baker (1928) did not follow Sharpe's opinion, reverting to de Sparre, probably because Blanford & Oates (1895), whose *Fauna of British India* Baker was updating, had not followed Sharpe. Peters (1931) cited the right publication and gave the author as 'G.S. [= E. Geoffroy]' bringing in the father of Isadore. But Whistler & Kinnear (1936) used Sparre and Ali & Whistler (1943) de Sparre, as did

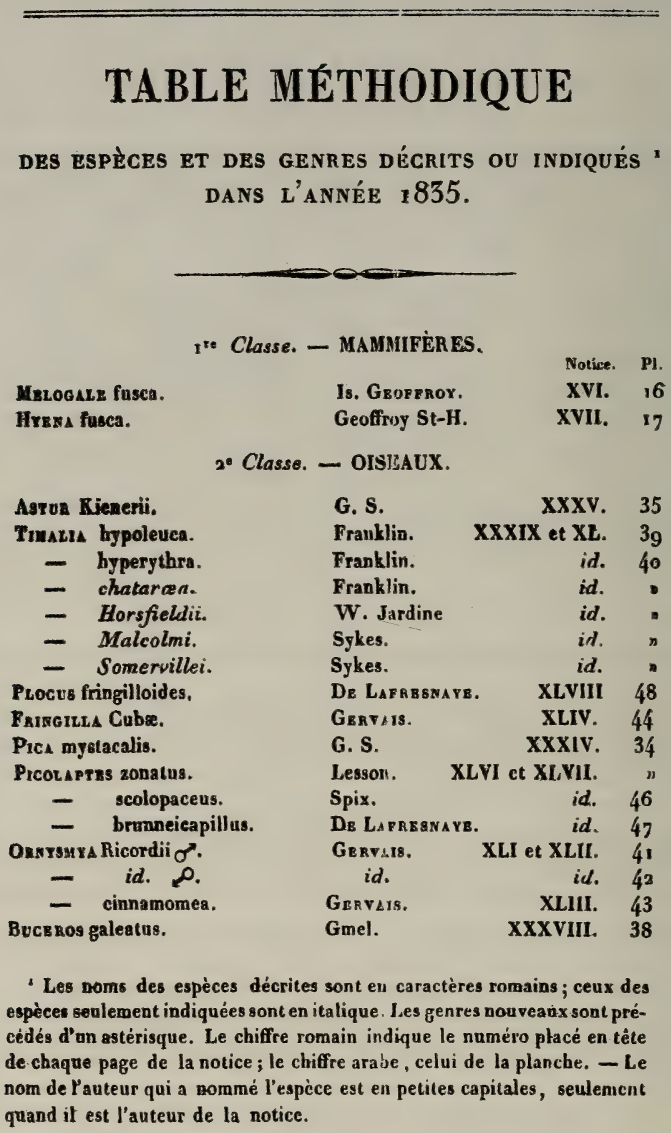

TABLE MÉTHODIQUE

DES ESPÈCES ET DES GENRES DÉCRITS OU INDIQUÉS [1] DANS L'ANNÉE 1835.

1re *Classe.* — MAMMIFÈRES.

		Notice.	Pl.
Melogale fusca.	Is. Geoffroy.	XVI.	16
Hyena fusca.	Geoffroy St-H.	XVII.	17

2e *Classe.* — OISEAUX.

		Notice.	Pl.
Astur Kienerii.	G. S.	XXXV.	35
Timalia hypoleuca.	Franklin.	XXXIX et XL.	39
— hyperythra.	Franklin.	*id.*	40
— *chatarœa.*	Franklin.	*id.*	»
— *Horsfieldii.*	W. Jardine	*id.*	»
— *Malcolmi.*	Sykes.	*id.*	»
— *Somervillei.*	Sykes.	*id.*	»
Plocus fringilloides.	De Lafresnaye.	XLVIII	48
Fringilla Cubæ.	Gervais.	XLIV.	44
Pica mystacalis.	G. S.	XXXIV.	34
Picolaptes zonatus.	Lesson.	XLVI et XLVII.	»
— scolopaceus.	Spix.	*id.*	46
— brunneicapillus.	De Lafresnaye.	*id.*	47
Ornysmya Ricordii ♂.	Gervais.	XLI et XLII.	41
— *id.* ♀.	*id.*	*id.*	42
— cinnamomea.	Gervais.	XLIII.	43
Buceros galeatus.	Gmel.	XXXVIII.	38

[1] Les noms des espèces décrites sont en caractères romains ; ceux des espèces seulement indiquées sont en italique. Les genres nouveaux sont précédés d'un astérisque. Le chiffre romain indique le numéro placé en tête de chaque page de la notice ; le chiffre arabe, celui de la planche. — Le nom de l'auteur qui a nommé l'espèce est en petites capitales, seulement quand il est l'auteur de la notice.

Figure 1. First page of the contents list for the 1835 volume of the *Magasin de Zoologie*, from a copy in the NHM Library, reproduced with permission.

Swann & Wetmore (1945). Since then, Smythies (1953), Ripley (1961, 1982) and Wells (1999) followed Peters (1931). Stresemann & Amadon (1979) did not follow Peters in plumping for Etienne Geoffroy St Hilaire and reverted to the non-specific 'G. S. = Geoffroy St Hilaire', and were followed by White & Bruce (1986). After a fruitless search for evidence (none of the authors cited above seems to have provided his rationale), Dickinson (2003) reverted to the identification used by Peters (1931) on the grounds that Isadore (1805–61) was more probable than Etienne (1772–1844).

Further evidence has finally been located. In 1839 an index (Table Méthodique) was compiled for the *Magasin de Zoologie* for the years 1831–38. This journal is most often bound by year (with the 1831–38 index no doubt usually bound in the 1838 volume), but was arranged in grouped pages by 'Classe' after the teaching of Cuvier. In one of the sets held in the Natural History Museum, South Kensington (Zoology Library; shelf mark ZS 940) the early parts are not bound by year, but with a volume for one 'Classe' or more, and in this set the index is not bound in the volume for Classe 2: Oiseaux, making it entirely understandable that the index has been overlooked. However, the index was located in one of the other contemporary volumes and therein *Astur Kienerii* is clearly linked to de Sparre.

Subsequently, I stumbled upon the footnote in Legge (1878), who made the same point as I have here concerning the usage of Geoffroy St Hilaire's name and also noted that 'in the Roy. Soc. Catalogue, vol. V' this is 'referred to as written by G. Sparre; and in all probability, this is the correct determination of the authorship'.

This rediscovered evidence, presumably originating from Guérin-Méneville, the publisher, and thus authoritative, completes the case for accepting Comte L. E. G. de Sparre (*c*.1800–54 or later: see Wynne 1966) as the author. G. S. had always seemed unlikely to translate to either Gervais or Geoffroy St Hilaire due to the evidence against this in the 1835 index.

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